

SAFER STREETS FOR **EVERYONE**

STUDY FINDINGS | NOVEMBER 2018



VISION ZERO
ANCHORAGE

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VISION ZERO IS A COMMUNITY COMMITMENT TO REDUCING LOSS OF LIFE AND SEVERE INJURIES ON ROADWAYS TO **ZERO.**

Dear Friends,

Achieving Vision Zero requires a community commitment.

More than 30 American cities have adopted Vision Zero policies, and evidence demonstrates that these policies work. New York City's Vision Zero plan is credited with reducing traffic fatalities by 22% in three years. A pilot project completed as part of Seattle's Vision Zero initiative reduced crashes on a hazardous section of Rainier Avenue by 15% overall, with injury crashes down 30% and pedestrian and bicycle crashes down 40%. Thanks to these success stories and many others, we know the steps we need to take to reduce and eventually eliminate serious injuries and deaths on our streets.

Anchorage roadways should be safer for everyone—pedestrians, bicyclists, and motorists. Our goal is achieving zero traffic deaths, and we can by taking a data-driven and coordinated approach to designing safer streets, public education, adopting and evaluating best practices, and enforcing effective laws.

Through better street design, education, and public involvement, we will make Anchorage streets safer and more accessible for everyone. That's a vision we all share.

Sincerely,

Ethan
Ethan Berkowitz

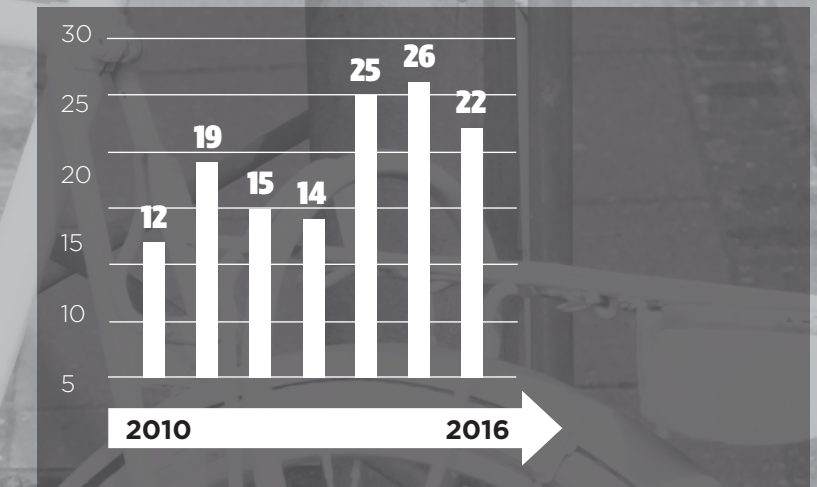
IN A FLASH, YOUR LIFE CAN CHANGE FOREVER

Everybody knows someone whose life has been irrevocably changed by a crash. On average, 19 people a year die on Anchorage streets. 43% of these deaths are people walking or riding a motorcycle or bicycle. For every person killed each year, 150 are seriously injured. A mistake on the roadway should not carry the death penalty.

The road system needs to keep us moving but it should also be designed to protect us. It's up to us as a community to decide if we accept the daily risk of death and injury as the cost of doing business, not just for faceless statistics but for people we know and love.

Solving the problem will take commitment from all of us. Our actions not only reflect our commitment to safety, but serve as a model to our families, our friends, our coworkers, and other road users. Anchorage streets should be safer for everyone—people on foot and in wheelchairs, in cars, using public transit, and on bikes.

ANCHORAGE CRASH FATALITIES: ALL MODES



BY MODE

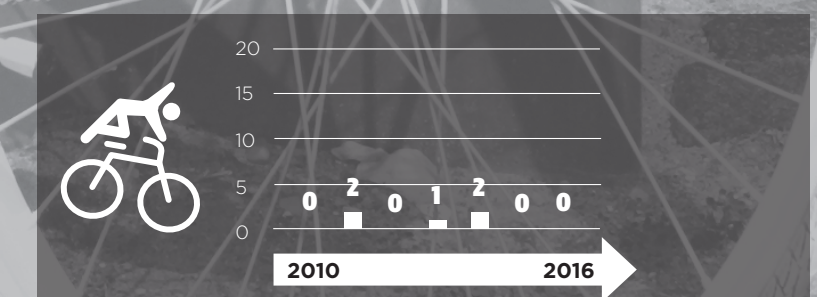
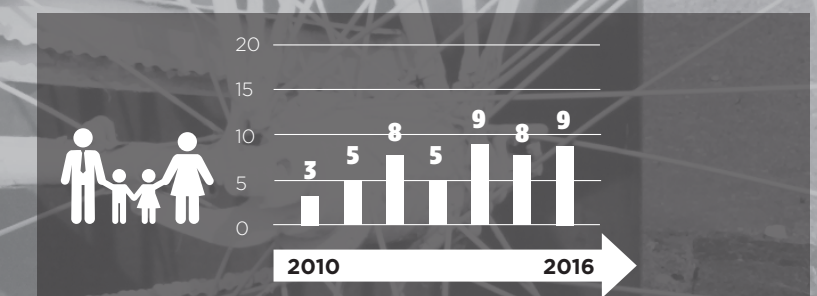
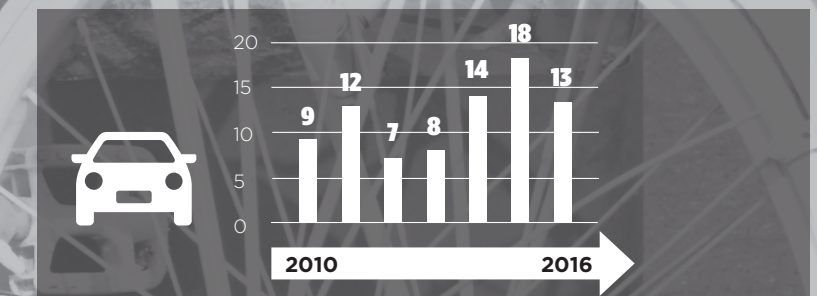


Image source: Villy Fink Isaksen, Wikimedia Commons.

ANCHORAGE | VISION ZERO

VISION ZERO: CREATING A CULTURE OF SAFETY

EVERYONE PLAYS A ROLE IN MAKING OUR STREETS SAFER

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all. The concept of Vision Zero originated in Sweden in 1997, when the Swedish parliament adopted it as the official road policy. Today, Sweden has one of the lowest annual rates of road death in the world (3 out of 100,000 compared to 12.3 in the US) despite a steady increase in traffic. Fatalities involving pedestrians have also fallen almost 50% in the last five years.

PRIMARY SOURCES

- » Alaska Department of Transportation & Public Facilities Crash Data—2010 to 2014 (the most recent set of data with crash location coordinates in GIS)
- » Municipality of Anchorage Crash Data—2010 to 2016
- » Federal Highway Administration Fatal Accident Reporting System (FARS)—2015
- » Alaska Trauma Registry Hospital Visits—2012 to 2016

ANCHORAGE'S VISION ZERO INITIATIVE TARGETS

- » Data-driven decision-making to ensure we target the right problems
- » Integrating human error into the solutions
- » Sharing responsibility for everyone's safety

This report summarizes the findings of an extensive analysis of vehicle, pedestrian and bicycle crashes. It includes both statistical and descriptive analyses of crash data on Anchorage's surface streets for all modes of travel—vehicles, motorcycles, pedestrians, and cyclists. We have analyzed the most recent five years of complete crash data available.

The data tell us the Anchorage transportation system is out of sync with our priorities for a livable, economically vibrant, and healthy community. Each life lost or injury sustained has a cost that extends far beyond the devastating personal loss and can continue for years. The cost of emergency response, long-term healthcare, and emotional trauma add to the burden of crash victims.

When a crash happens near your home or business, or kills someone on a sidewalk, the sense of safety we all take for granted is lost. By taking action to prioritize safety, we can create a new culture where everyone has a choice to walk, bike, drive, ride the bus, or ride a motorcycle and feel safer and more comfortable moving around Anchorage.

VISION ZERO PRINCIPLES



HUMAN LIFE AND HEALTH are priorities in our community.



Traffic deaths and severe injuries are **PREVENTABLE**.



WE ARE HUMAN AND MAKE MISTAKES. The roadway system should be designed to protect us.



SPEED IS A CRITICAL FACTOR in crash severity. The most effective approach is to systematically prioritize safety over speed.



RESPONSIBILITY IS SHARED between system designers and road users.

Image source: John Britton, Wikimedia Commons.

OUR NEIGHBORS WEIGH IN ON TRAFFIC SAFETY

Human stories are an important piece of the puzzle to provide quantitative data. Outreach began in 2016 when the Steering Committee was established and Vision Zero was officially launched with a town hall meeting and community surveys. Conversations with city and state departments, non-profit service providers, and community stakeholders continued throughout this process.

- » Anchorage is not a walking community: **if you are walking, you are perceived as suspicious.**
- » Too much texting and “selfieing” while driving.
- » **Stop red light runners.**
- » Lack of police enforcing laws costs us: high accident rate, high injury rate, HIGH auto insurance. Reckless drivers.
- » This is a **social justice issue**: probably more likely to have low income people impacted.
- » Need to humanize pedestrians and shift to a culture of respect for them.
- » **Speed limits are too fast.**
- » Ban cell phones for drivers, pedestrians, bikes
- » Lack of compassion for walkers in the cold—not given right of way.
- » People **not watching out for each other** (peds, bikes, cars).
- » Lack of education for bike laws.
- » There is **a lot of victim blaming**: pedestrians and bikers, whether or not they are following the rules or being safe, and generally shifting responsibility to people other than the driver.
- » Need better means to highlight problem areas **BEFORE someone is KILLED.**
- » **My husband was run over** last year legally crossing Muldoon within the right of way.
- » Obstacle to Equitable Access: Lack of real, protected, and plowed bicycle lanes and pedestrian pathways, sidewalks to safely get to places
- » **I have never seen the animosity towards cyclists and pedestrians elsewhere like I have here.**
- » I would really like to see **motorcycle awareness** as part of your safety mission.

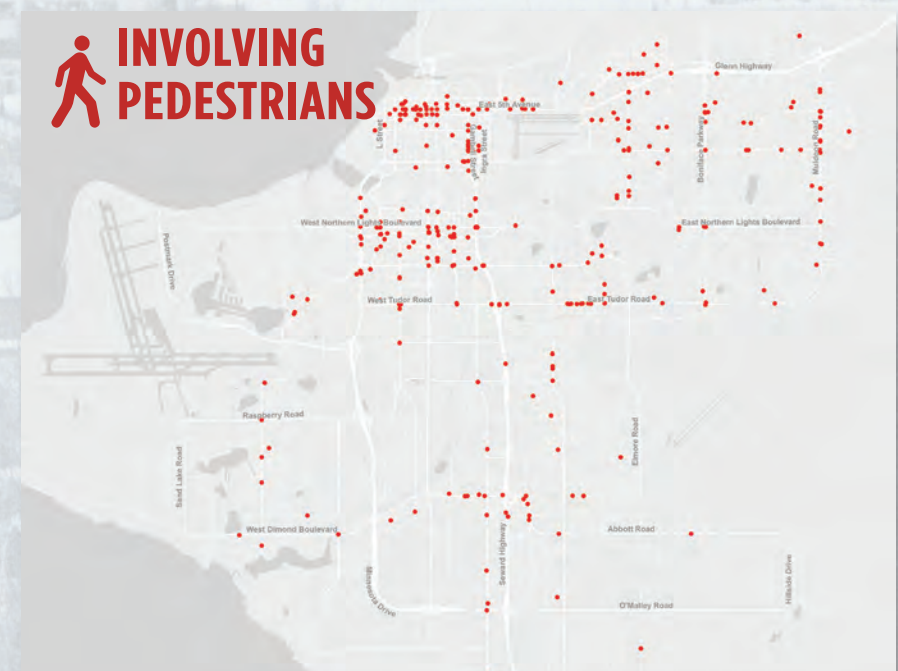
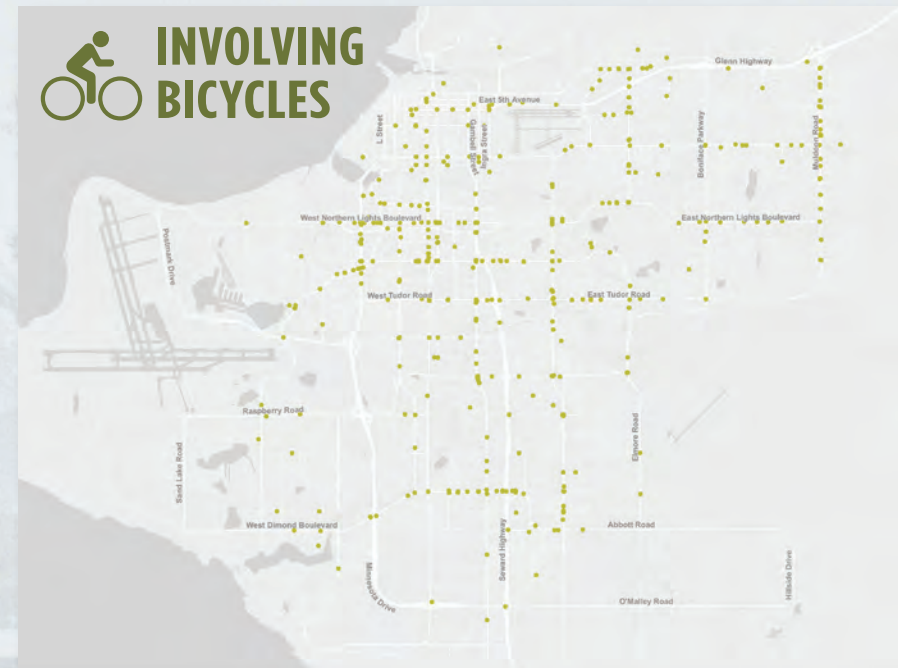
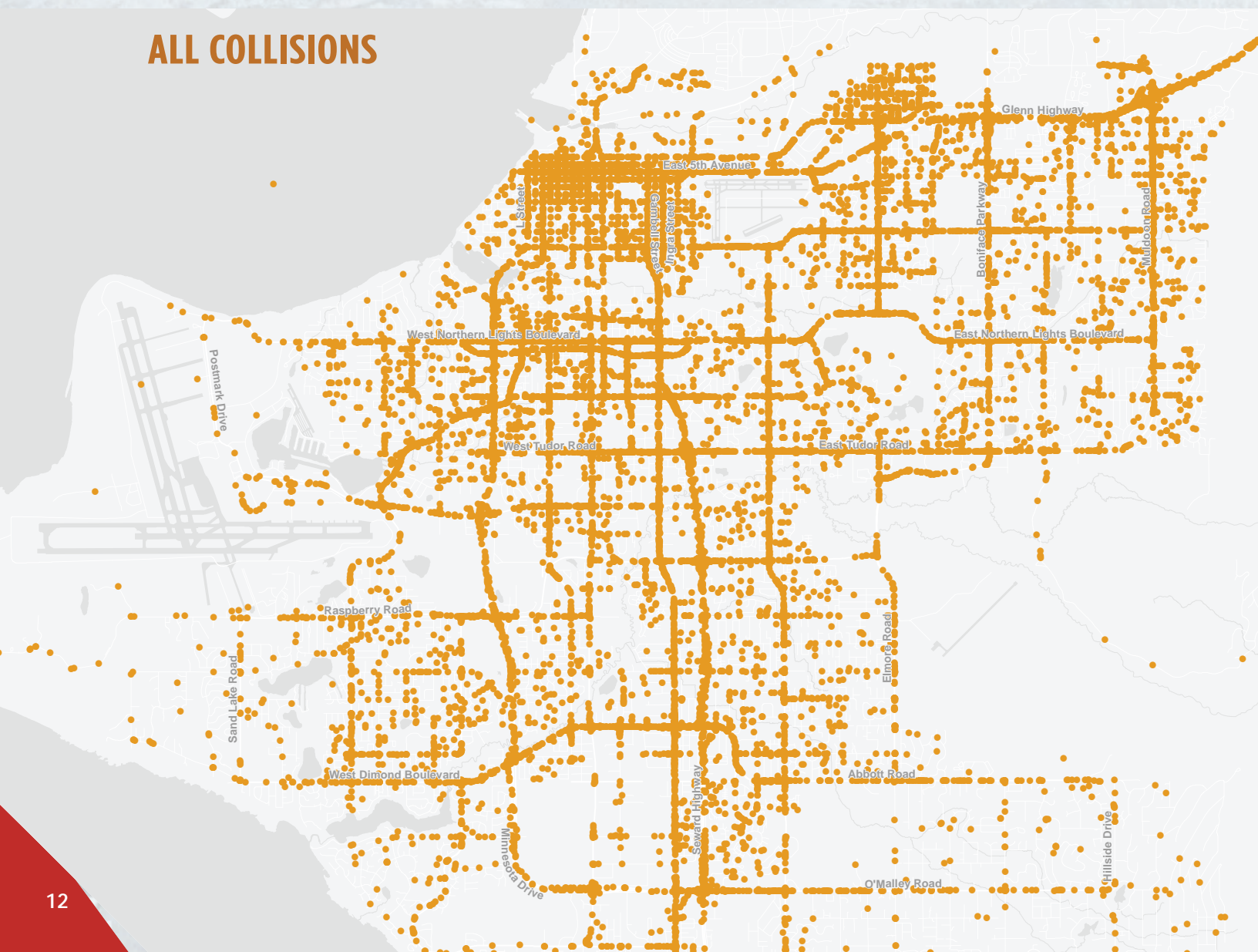


ANCHORAGE'S STORY BY THE NUMBERS

THERE WERE **25,529 COLLISIONS** IMPACTING
93,888 PEOPLE FROM 2010 TO 2014. THAT'S
AN AVERAGE OF **51 PEOPLE PER DAY**

who were directly impacted and may have lost time from work, had to seek medical care, incurred unexpected expenses or worse, were permanently disabled, or buried a loved one.

ALL COLLISIONS



WHO

In all collisions from 2010 to 2016, how many victims were involved?

- » 956 bicyclists
- » 929 pedestrians
- » 39,437 drivers and their passengers (includes motorcycles)

133 people died, 1,118 suffered serious injuries, and 17,701 suffered minor injuries.

Each one of these was someone’s child, parent, friend, classmate, coworker, or neighbor.

Safety for drivers and passengers has improved significantly due to advances in vehicle safety technology. Still, motorists account for a high number of severe injuries and fatalities. Our most vulnerable road users—pedestrians, bicyclists and motorcyclists—do not benefit from the same measures that protect motor vehicle occupants, such as vehicle crumple zones, air bags, or protected passenger compartments.

It is important to keep in mind that these statistics do not account for exposure—that is, how many people walk, bike, and drive and how many miles they travel by those modes. For example, while fewer pedestrians are killed than drivers, there are also many fewer people walking, so their risk of being killed is much higher than raw fatality numbers suggest. Conversely, given

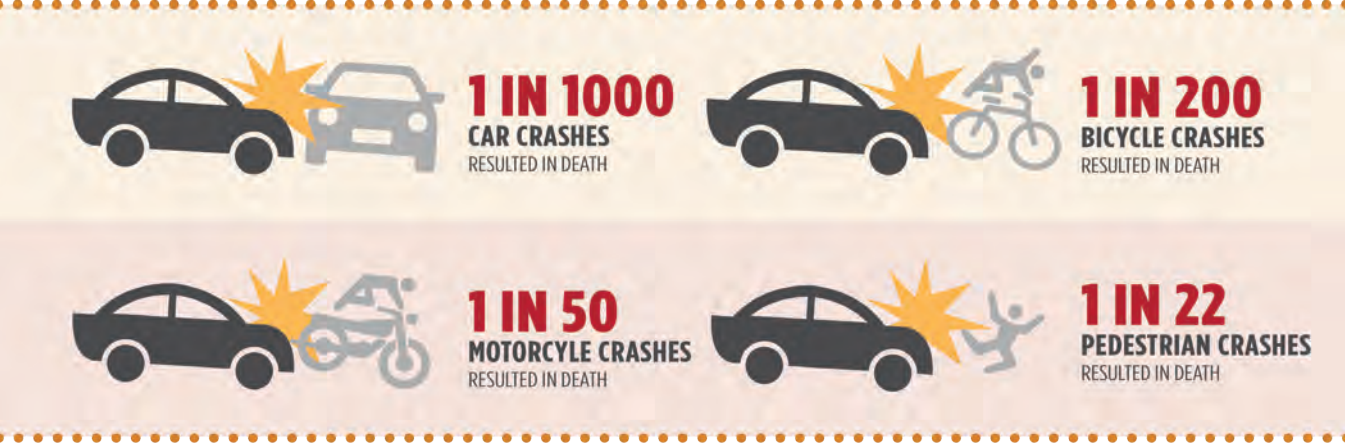
the many thousands of drivers on the road many thousands of miles each year, the handful of driver fatalities results in a comparatively low risk of driver death on Anchorage’s roadways.

EQUAL SAFETY: WHO YOU ARE SHOULDN'T MATTER

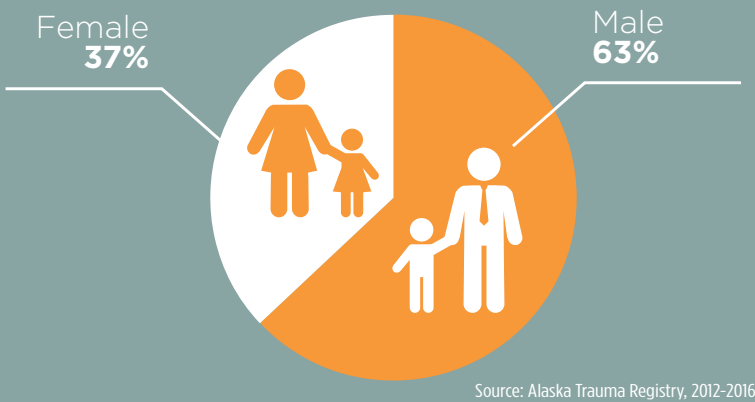
We all need to travel every day to buy food, find housing, get to school and work, visit friends and family, and obtain healthcare services. Low-income people, people of color, and people with disabilities in the United States face transportation hurdles that can make simply accessing basic needs time consuming, dangerous, and sometimes almost impossible. Many walk, bike, or use a wheelchair. Anchorage follows the same national trend. People of color in Alaska are disproportionately impacted by traffic crashes.

We need to ensure our transportation network addresses the needs of all people, regardless of economic class, race, sex, age, ability or any other factor.

CRASH FATALITIES BY MODE

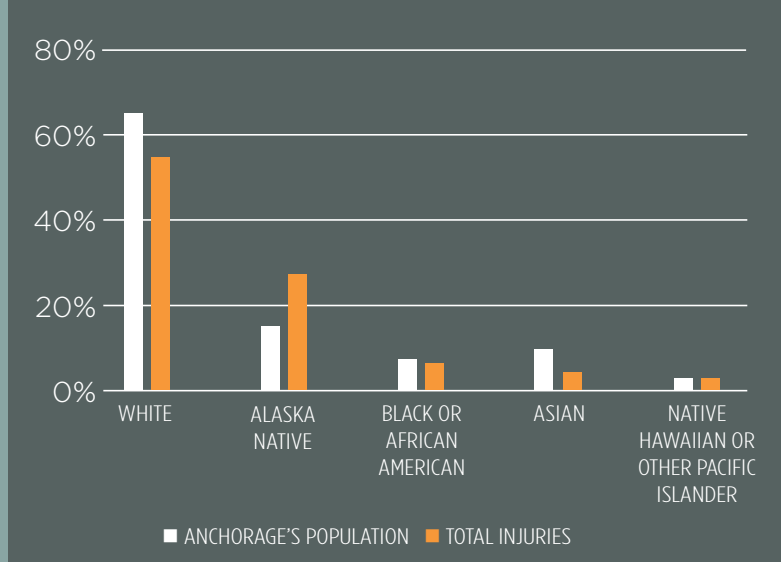


INCIDENTS THAT LED TO A HOSPITAL VISIT: ALL MODES



Source: Alaska Trauma Registry, 2012-2016

INCIDENTS THAT LED TO A HOSPITAL VISIT BY RACE: ALL MODES



Source: Alaska Trauma Registry, 2012-2016, Department of Labor and Workforce Development

WHY

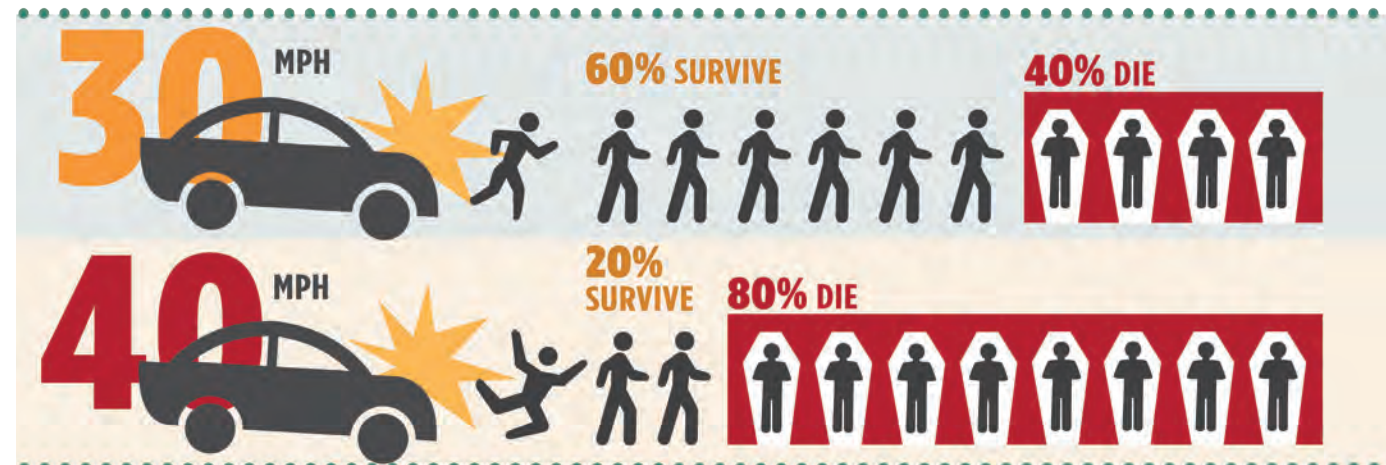
Human choices play a significant role in traffic crashes. Both nationally and in Anchorage, the causes of crashes attributed to human behavior are underreported.

Many crash investigation reports provide fields to describe the actions of drivers and non-motorists that contributed to a crash such as failure to yield, improper turn, or collision with a fixed object, but they don't always address why. This is because these actions are often difficult to observe and measure. For example, a driver failing to yield may not be the root cause of a crash. They may have failed to yield because they were looking at the passenger seat while reaching for a buzzing cell phone.

Based on the data available in Anchorage, people traveling while intoxicated, speeding, running red lights, and driving distracted/inattentively account for 40% of fatal and severe incidents with alcohol and drugs cited in nearly one-third of fatalities. With the legalization of marijuana, this number is likely to increase.

1. Reducing Speeding-Related Crashes Involving Passenger Vehicles NTSB/SS-17/01 NHTSA
2. Distracted Driving 2015, National Center for Statistics and Analysis, Distracted Driving: 2015, in Traffic Safety Research Notes. DOT HS 812 381. March 2017, National Highway Traffic Safety Administration: Washington, DC.
3. NHTSA

SLOWING DOWN SAVES LIVES



Source: Pasanen, E. Driving Speeds and Pedestrian Safety; a mathematical model. Technical Report No. REPT-77, and Nordisk Kabel- og Traadfabriker, Copenhagen, Denmark, 41 pp., 1992. Helsinki University of Technology, Laboratory of Traffic and Transportation Engineering, Espoo, Finland.

SPEEDING

More than 112,000 people died in speed-related crashes in the US between 2005 and 2014, averaging more than 10,000 deaths each year. This is on par with the number of drunk driving fatalities during the same time, yet receives far less attention. Speeding impacts also cost an estimated at \$52 billion in 2014, compared to \$44 billion in losses from drunk driving.¹

DISTRACTED DRIVING

In the US, crashes reported to involve a distracted driver kill an average of nine people and injure more than 1,000 every day.² Sending or reading a text takes your eyes off the road for five seconds. At 55 mph, that's like driving the length of an entire football field with your eyes closed.³

Anecdotally, drivers seem more distracted than ever before yet in Anchorage only 61 of 35,529 crash records reported cell phone use. There is so much loss, but so little data about key driver factors in fatal and serious crashes.

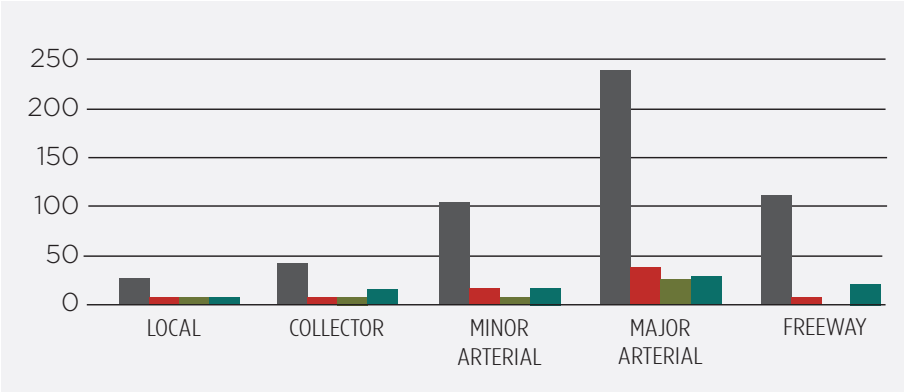
ALCOHOL & DRUG-RELATED CRASHES



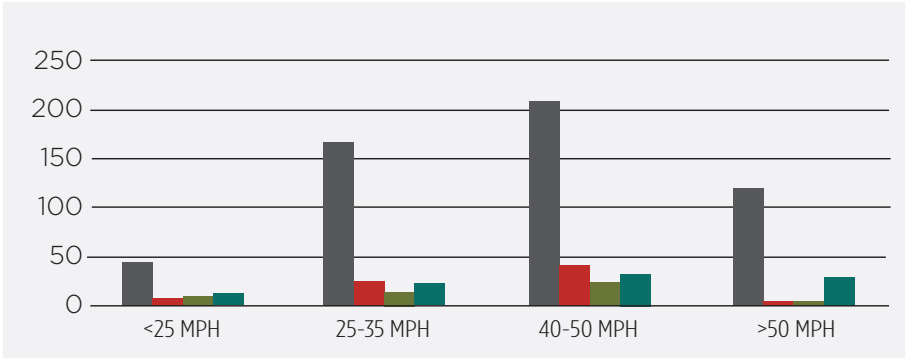
WHERE

While fatal and serious crashes have happened throughout the city, they are more concentrated in certain areas. A small percentage of our streets account for a high percentage of people killed and severely injured in traffic collisions.

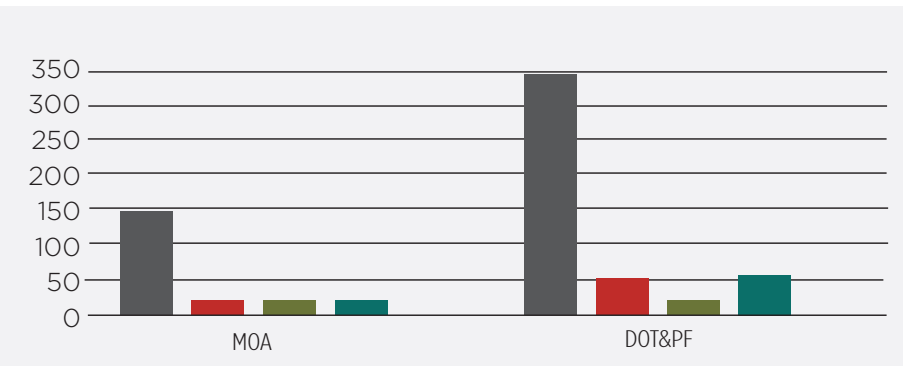
ROADWAY FUNCTIONAL CLASS



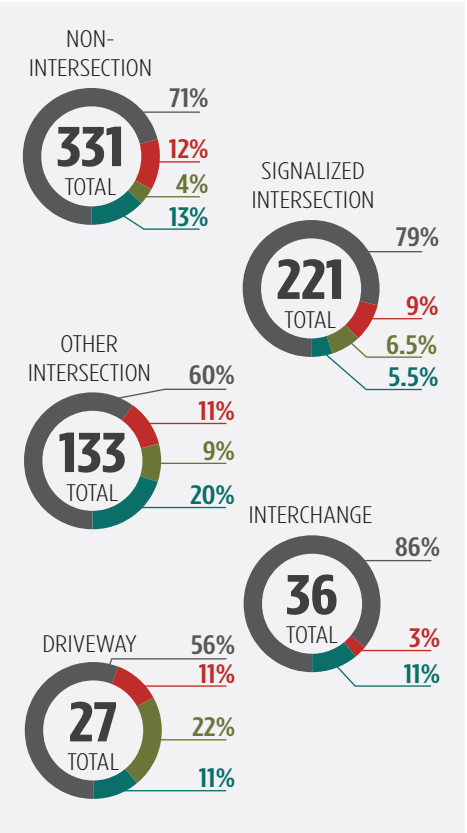
ROADWAY POSTED SPEED



ROADWAY OWNERSHIP



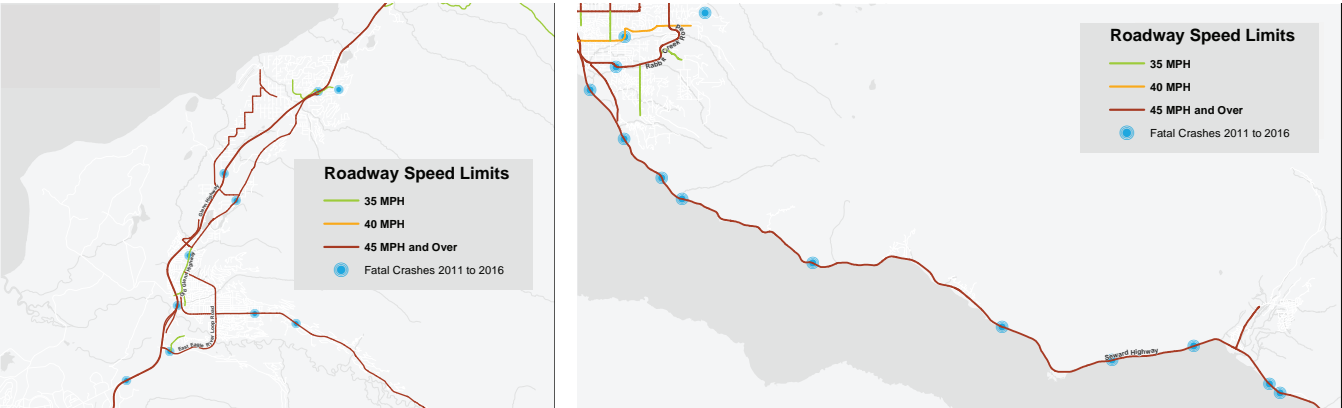
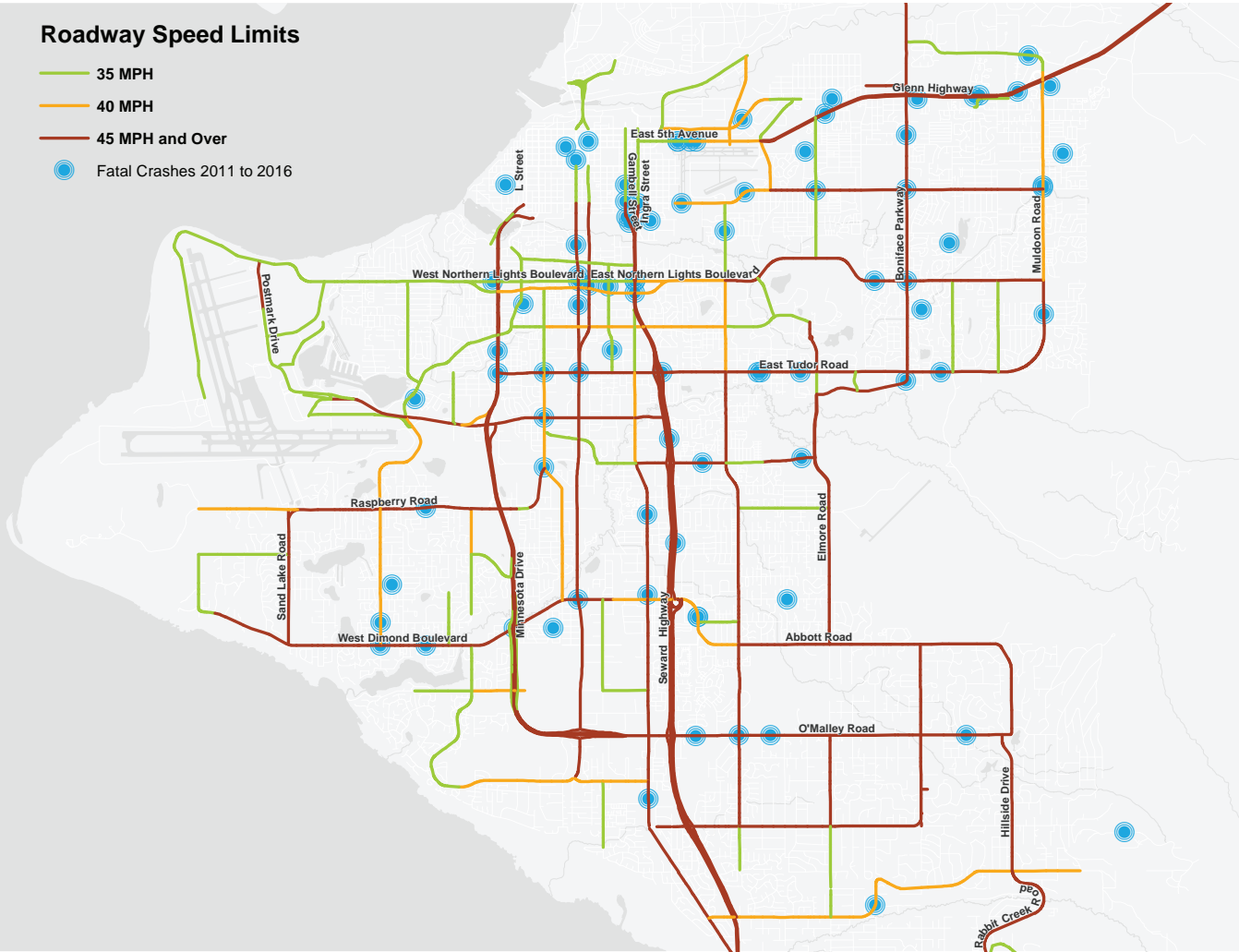
CRASH LOCATION



KEY



ROADWAY SPEED LIMITS



HIGH INJURY NETWORK

While severe traffic crashes and fatalities are a persistent problem across the city, crash data show certain corridors that are more seriously impacted than others. This high injury network was identified using the Equivalent Property Damage Only (EPDO) Average Crash Frequency Methodology from the Federal Highway Administration Safety Manual.

This analysis looks at all crashes in Anchorage but attaches more weight to crashes resulting in serious injuries or fatalities, less importance to those resulting in a moderate or slight injury, and the least importance to crashes that only damage property. Investing in safety interventions along these corridors and comparable alternative street networks will have a significant impact on reducing fatalities and severe injuries.

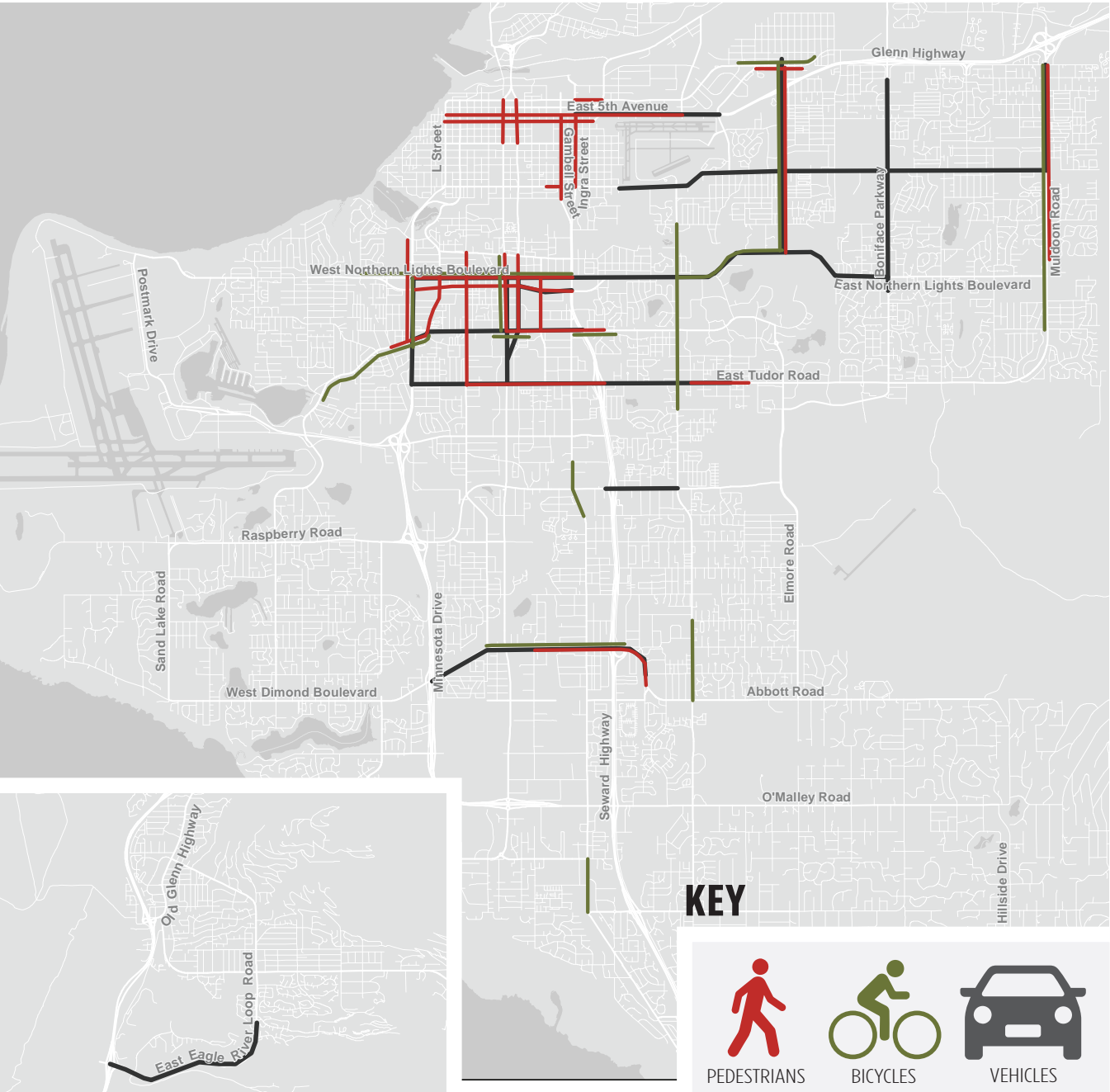


Image source: Jason Bain, Wikimedia Commons.

ADVANCING PROJECTS, POLICIES, AND EDUCATION FOR ROADWAYS WITH THE MOST PRESSING SAFETY ISSUES AND THAT ENCOURAGE A WELL-CONNECTED MULTIMODAL TRANSPORTATION NETWORK WILL HAVE A SIGNIFICANT IMPACT ON REDUCING FATALITIES AND SEVERE INJURIES.

CRASH TYPE

VEHICLE-PEDESTRIAN



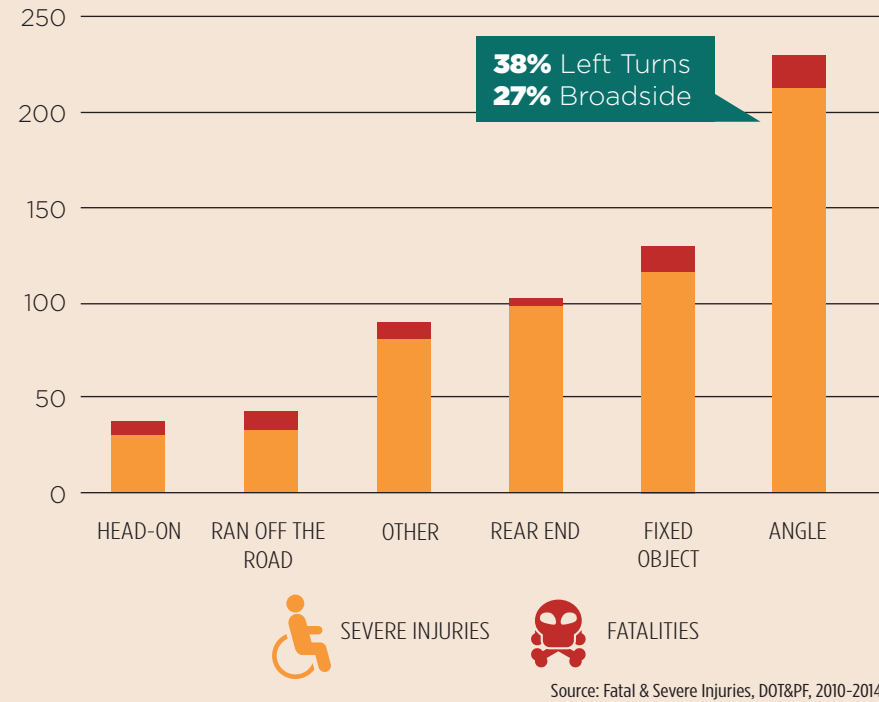
23 FATALITIES
55 SEVERE INJURIES

VEHICLE-BICYCLE

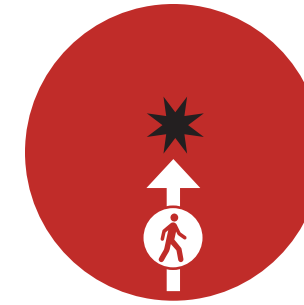


4 FATALITIES
41 SEVERE INJURIES

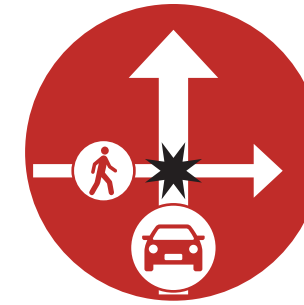
VEHICLE-VEHICLE



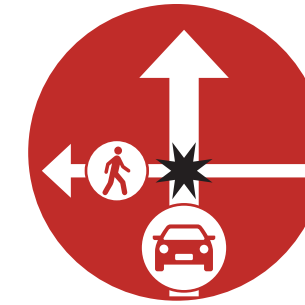
PEDESTRIAN TOTAL 78



65%
pedestrian actions are unknown



22%
pedestrian had right of way

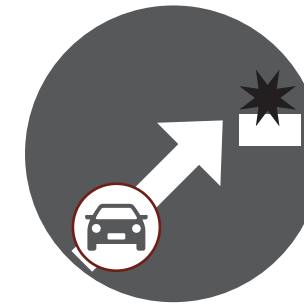


8%
pedestrian crossing away from signal

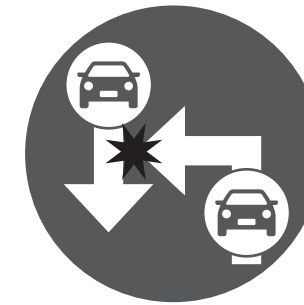


5%
pedestrian disregarded signal

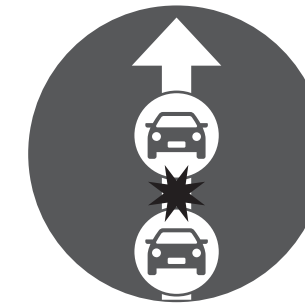
VEHICLE (AUTO NON-MOTORCYCLE, NON-PED/BIKE) TOTAL 537



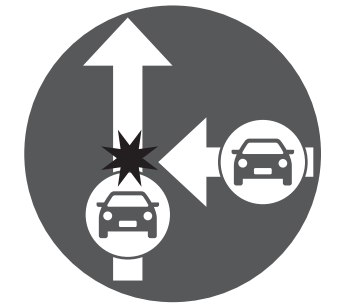
27%
fixed object/ran off of road



18%
left turns

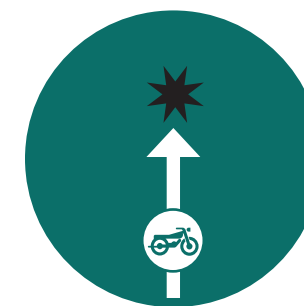


17%
rear end

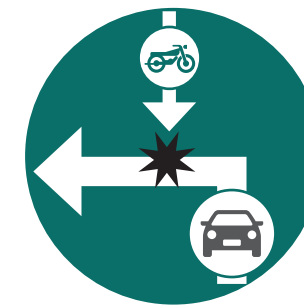


10%
broadside (T-bone, right-angle, etc)

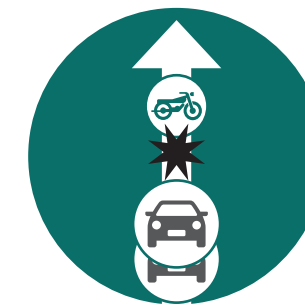
MOTORCYCLE (NON-PED/BIKE) TOTAL 88



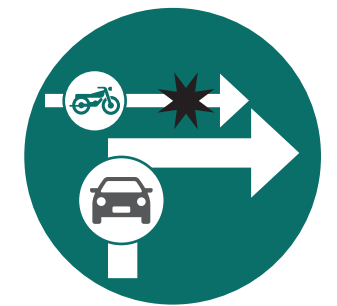
45%
single vehicle



23%
vehicle turning left, motorcycle straight

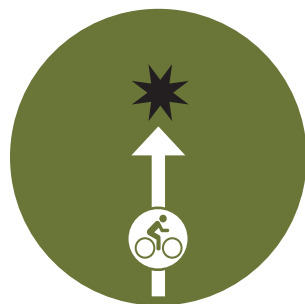


10%
rear end



3%
vehicle turning right

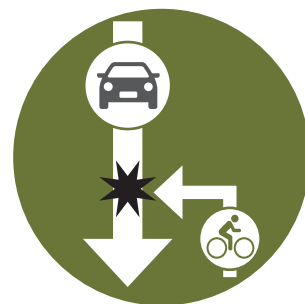
BICYCLE TOTAL 45



40%
bicycle actions are unknown



24%
right hook (vehicle and bike traveling same direction, driver turns right into bike)



9%
bicycle turning left



7%
vehicle turning left

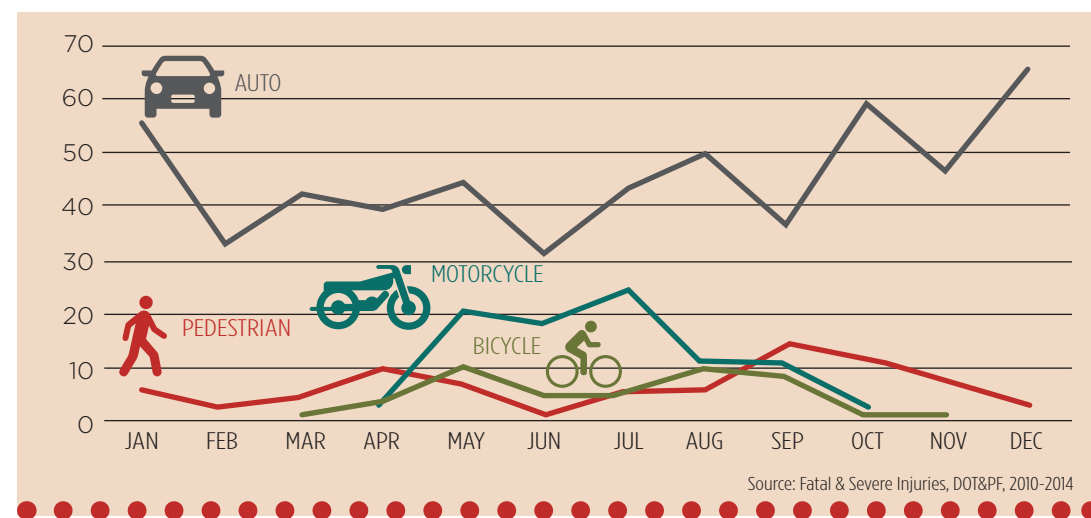
PUTTING DATA TO WORK

WHEN

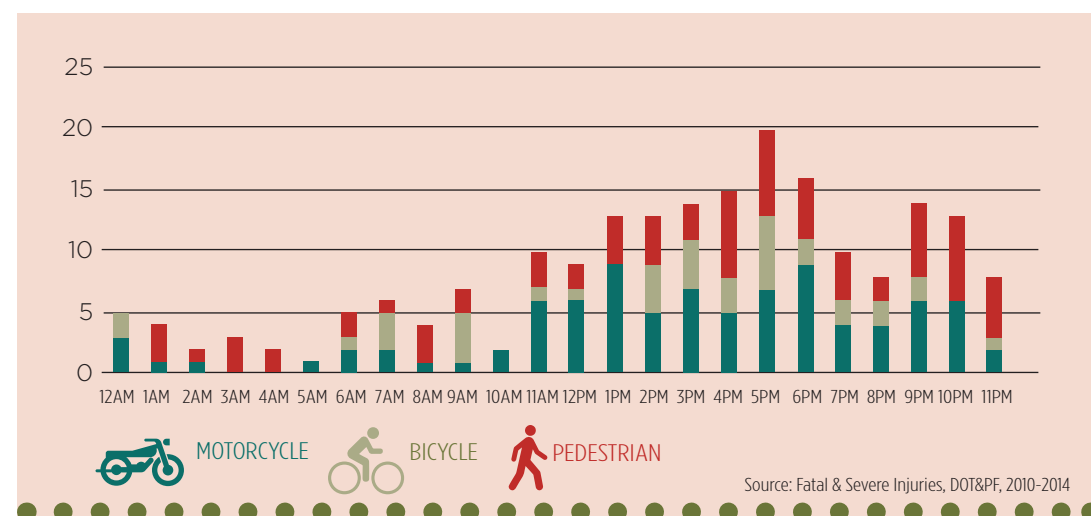
Time of day and season play important roles in evaluating crashes, in part because other dangerous factors are compounded during hours of darkness.

- » **44%** of fatal and severe injury crashes occur in daylight on dry roads.
- » **30 %** occur in ice and snow conditions in all lighting.

MONTH



TIME OF DAY



WHAT WE KNOW CAN HELP US SAVE LIVES

SOLUTIONS THAT WORK: NATIONAL BEST PRACTICES

The metrics of success are simple: one fatality or serious injury on our roads is one too many.

To frame road safety policies and interventions, the gold standard is a Safe Systems Approach—all parts of the system must be strengthened in order to save lives. It is an inclusive approach that caters to everyone using the road system, including drivers, motorcyclists, passengers, pedestrians, cyclists, and commercial and heavy vehicle drivers. While there is still a strong engineering component, the focus is to accept that mistakes will happen on the road, responsibility for safety is shared by all users, and the system should be forgiving so crashes do not result in death or serious injury.

Responsibility has historically been placed on the individual road user: bad drivers, careless bicyclists, and distracted pedestrians are seen as the causes of collisions. Under the Safe Systems approach, actions and responsibilities are more heavily attributed to the system designers, including engineers, public health professionals, policymakers, and law enforcement; however, individuals still have a responsibility to abide by laws and regulations. Key elements that must be part of this transformative change include a measurable action plan and institutionalizing change so that effective Vision Zero systems live long beyond today's advocates or elected leaders.

Through the analysis of crash data for Anchorage and collaboration with stakeholders, five key themes emerged.

VISION ZERO THEMES

a. **Enhance processes and collaboration**—

Vision Zero is a new philosophy for managing transportation and requires a cultural shift. Internal changes (among staff and city leaders) and education are foundational to its success.

b. Build safer streets for everyone—Streets must be designed to be safer for everyone, no matter how they choose to travel.

c. Reduce speed—Safer design must also include safer speeds. In addition to roadway design, specific strategies need to be employed to reduce speeding for the sake of safety.

d. Promote a culture of safety—Individual, institutional, and community education are integrated with enforcement strategies and changes to policies and legislation to build a culture of safety.

e. Improve data collection, analysis and accessibility—Pursuing quality data and consistent reporting to determine dangerous behaviors and evaluate work on an ongoing basis is imperative.

THE ACTIONS AND STRATEGIES TO ACHIEVE VISION ZERO ARE ORGANIZED AROUND THESE DESIRED OUTCOMES. GETTING TO ZERO FATALITIES IS THE IDEAL VISION. CONTINUOUS IMPROVEMENT IS THE MINIMUM EXPECTATION.



ACTION PLAN

FOR VISION ZERO TO SUCCEED, WE NEED EVERYONE'S HELP.

Vision Zero's goal is to reframe how cities look at traffic fatalities—not as “accidents” but as preventable incidents that can be addressed through a multidisciplinary approach involving road design, education, and enforcement. There is no one solution.

Both the Municipality of Anchorage and the Alaska Department of Transportation & Public Facilities have already made tremendous progress in making our roads safer. This Action Plan includes strategies to continue the positive momentum to achieve measurable improvement in traffic safety. It is designed to address the disparity in where fatal and severe crashes occur and who they impact.

Anchorage commits to engaging the community in meaningful, culturally-relevant ways and prioritizing equity in all programs and policies outlined in the Action Plan. While severe crashes affect everyone whatever their race, gender, age, or income level, some groups are impacted more than others.

VISION ZERO KICKOFF

VISION ZERO CITIES IN THE UNITED STATES

Updated January 2018



A VISION ZERO CITY MEETS THE FOLLOWING MINIMUM STANDARDS:

- » Sets clear goal of eliminating traffic fatalities and severe injuries
- » Mayor has publicly, officially committed to Vision Zero.
- » Vision Zero plan or strategy is in place, or mayor has committed to doing so in clear time frame.
- » Key city departments (including police, transportation and public health) are engaged.

PROCESSES AND COLLABORATION

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Designate lead Municipality of Anchorage (MOA) Agency for Vision Zero.	<p>Vision Zero City Lead Agency Examples:</p> <ul style="list-style-type: none">» Health Bureau (Bethlehem, PA)» Transportation Department (Austin, TX; Bellevue, WA; Chicago, IL; Seattle, WA)» Transportation & Mobility (Denver, CO and Fort Lauderdale, FL)» Public Works (Eugene OR; Sacramento, CA)» City Manager's Office (Columbia, MO) <p>The Vision Zero Network is also calling on Metropolitan Planning Organizations (like AMATS) to take a leadership role. Through regional planning, funding and policy, metropolitan planning organizations (MPOs) are uniquely positioned to facilitate collaboration across departments and jurisdictions and incorporate quantitative safety criteria into project prioritization. Additionally, as part of federal requirements (FAST Act) and evidence-based target setting, MPOs are already required to set and track five safety performance targets: number of fatalities; rate of fatalities per 100 million vehicle miles traveled (VMT); number of serious injuries; rate of serious injuries per 100 million VMT; and number of non-motorized fatalities and non-motorized serious injuries.</p>	Lead Agency is designated	Director of Community & Economic Development
Identify Vision Zero coordinator (full- or part-time position) within lead agency to be committed to Vision Zero and establish plans and processes to institutionalize Vision Zero within the MOA.	<p>This position is necessary to ensure that all elements of Vision Zero, from infrastructure improvements to changes in policy and strategy, are evidence-based and data driven, and that their impacts are measured and evaluated for effectiveness to inform future projects and achieve meaningful outcomes. Vision Zero cities have staffing ranging from one person who is either part- or full-time up to a 10-person Vision Zero unit (Seattle). San Luis Obispo, CA has a rotating program and is staffed by different departments each year until they can hire a full-time active transportation staff member.</p>	Staff position dedicated at least part-time to Vision Zero	Director of Community & Economic Development, Lead Agency
Create a multi-agency Vision Zero Task Force that meets regularly to review traffic crash data, equity, transportation system performance, funding, and action plan progress.	<p>Cross-departmental and jurisdictional collaboration is an essential tenet of Vision Zero. Traffic safety is not the purview of any one department or jurisdiction. One of the most powerful mechanisms for planning and executing an effective program is to bring together those who have responsibility and expertise in the key areas that impact safety. New York City has the longest standing VZ program in the US. They have an intentional, coordinated planning and implementation effort among multiple departments to chart clear goals and consistently evaluate for progress. Potential Task Force representatives: MOA-Traffic Engineering, Project Management and Engineering, Maintenance and Operations, Capital Projects, Department of Health and Human Services, Anchorage Police and Fire Departments, Planning, Anchorage Metropolitan Area Transportation Solutions (AMATS), Transit, Legal, Parks and Recreation, and the Anchorage School District; Alaska Department of Transportation & Public Facilities (DOT&PF)-Highway Safety Improvement Program, Program Development, Design, Planning, and Pedestrian and Bike Coordinator; and Social Service and Non-Profit Special Interest Groups-focus on vulnerable users, accessibility, and homelessness.</p>	Quarterly meetings held	Lead Agency



Action Item	Example Best Practices	Measurable Performance Metric	Lead
Regularly update policy makers, MOA departments, and partnering agencies.	<p>To affect a cultural shift and overcome institutional barriers to change, organizational practices need to evolve, and a diverse set of stakeholders needs to come together to help solve problems. This can be facilitated through regular communication and education. Updates should be given at regularly scheduled MOA department meetings as well as to AMATS Technical Advisory and Policy Committees, MOA Assembly, Planning and Zoning and Urban Design commissions, other appropriate boards, commissions and committees, and DOT&PF.</p>	At least 6 updates per year	Vision Zero Coordinator, Vision Zero Task Force Members
Secure a sustainable funding source for the Vision Zero program.	<p>Most Vision Zero programs have sustainable funding dedicated from the general operating budget. Many also receive money from the following sources: Governor's Highway Safety Representative (NHTSA) Grant, Highway Safety Improvement Program from state DOTs, Transportation Alternative Program through the MPO/ Federal Highway Administration (FHWA), Safe Routes to Schools program, bonds, and miscellaneous public health grants. Examples of innovative funding from other Vision Zero cities include:</p> <ul style="list-style-type: none">» One Percent For Safety (Columbia, MO)—1% of estimated project costs (for projects costing \$500,000+) is dedicated to implementing the Vision Zero Action Plan.» Incentivized Joint Departmental Budgeting (Los Angeles, CA)—The City adds a cover sheet to standard budget requests and extra points are awarded for demonstrating that one department's project leverages funds to another.» Road to Zero Safe System Innovation Grant (National Safety Council and Partners)—Organization must clearly explain how its innovative program will reduce roadway fatalities, set a time frame for the reduction, outline how the program will be evaluated, detail how the organization intends to reach its target audience, and list the funds requested.	Dedicated funding source for program	Vision Zero Coordinator, Vision Zero Task Force, Department Directors



BUILD SAFER STREETS FOR EVERYONE

Action Item	Example Best Practices	Measurable Performance Metric	Lead
<p>When developing the Capital Improvement Program (CIP) and AMATS Transportation Improvement Program (TIP), prioritize transportation improvement projects that:</p> <ul style="list-style-type: none">» Are on a Vision Zero high injury network,» Have a documented vulnerable user safety concern identified by data, or» Provide a comparable alternative route to the high injury network for vulnerable users.	<p>There are streets where more crashes occur than others. Investments should focus on streets known to have concerning crash histories, have characteristics similar to those with higher number serious crashes, or provide a comparable alternative safer route for vulnerable users.</p> <ul style="list-style-type: none">» In Fremont CA, when the Vision Zero Action Plan was approved, the City Council also approved budget amendments to drop some existing capital projects in exchange for a new set of projects that could deliver higher-value safety benefits that aligned with Vision Zero.» Fairbanks' MPO has incorporated quantifiable crash rate percentile thresholds in the Metropolitan Transportation Plan project development and TIP scoring criteria. Safety treatments can be applied as systemic solutions and be completed at locations with similar characteristics—and therefore crash risk—as high crash locations. <p>Example Project Prioritization Metrics:</p> <ul style="list-style-type: none">» Located on a high injury corridor for the targeted mode or provides a comparable alternate route to a high injury network» Statistically determined over-representation of severe crashes and/or targeted crash types» High frequency of crashes involving vulnerable road users» Proven cost effectiveness» Special priority for low-cost systemic treatment	Number of segments/intersections receiving improvements compared to prior years.	MOA Departments, AMATS

CREATE SAFER SPEEDS

Action Item	Example Best Practices	Measurable Performance Metric	Lead
<p>Strategically target vehicular red light running, speeding, and impaired and distracted driving through Anchorage Police Department (APD) presence/enforcement complemented by a focused education campaign along the high injury network.</p>	<p>Speeding, red light running, distracted driving and impairment were the top concerns during public outreach efforts and are supported by the data. Enforcement and supporting educational activities, like media releases about the increased police presence and Vision Zero, should be concentrated within the high injury network, during peak seasons, and at specific times of day. Vision Zero best practices caution communities not to rely too much on enforcement and to consider how to improve the entire system through efforts such as street design, education, and setting policies. The Bloomberg Initiative for Global Road Safety reported that finding the right balance between deterrence efforts and education versus penalties for those caught violating road safety laws can help improve road user behavior and maintain community support for road safety efforts.</p> <p>APD presence and enforcement does not necessarily have to equate to tickets. Some communities park a patrol car with lights flashing at strategic locations and move it around the network.</p> <p>Experience and research tell us vulnerable users from communities of concern suffer a disproportionate burden of traffic fatalities and severe injuries. They stand the greatest chance of being subject to inequitable traffic enforcement; therefore, it is recommended that bicyclists and pedestrians are not part of the initial enforcement campaign unless it is through “positive tickets” and education. Positive ticketing is often aimed at youth and other vulnerable users for being caught doing the right thing such as wearing a helmet or crossing in a crosswalk.</p>	One corridor per month.	APD, Vision Zero Coordinator
<p>Begin process to amend MOA charter, code and judiciary process to allow Automated Traffic Enforcement Cameras and conduct pilot studies on their effectiveness.</p>	<p>FHWA has made a general estimate that automated traffic enforcement reduces red light running incidents by 15%. The Institute of Transportation Engineers (ITE) report <i>Automated Enforcement in Transportation</i> (available at www.ite.org) reports a 23% to 83% reduction in violations from red light cameras. Another study concluded that red light camera enforcement can reduce crashes at urban signalized intersections by up to 11% and left-turn crashes by up to 45% (FHWA – Signalized Intersection Safety Strategies 2/08).</p> <ul style="list-style-type: none">» 419 communities have red light camera programs as of September 2018.» 145 communities have speed camera programs as of September 2018. This includes statewide work zone programs in Illinois, Maryland, and Oregon.» Some entities allow camera use citywide; others limit speed cameras to school zones, residential neighborhoods, construction zones, streets that border municipal parks, or areas where speed limits are posted at 30 mph. Most red light cameras are permitted citywide, in specified jurisdictions (like midtown), or only at the intersection of two arterials.» The City of Seattle started with a 12-month pilot project designed to test the effectiveness of red light running traffic safety cameras at selected arterial intersections. Based on the favorable findings of the pilot project, the City approved a significant expansion of the program. Four factors were weighed in choosing locations: right-angle crashes, serious pedestrian injuries, the frequency of red light running based on video observation, and geographic distribution.» Many jurisdictions treat automated enforcement citations like parking tickets in that the registered owner is liable. Automated enforcement citations are generally civil or administrative violations that do not result in points and are not made part of the driver's record.	Automated enforcement permitted in the MOA to conduct pilot studies.	Vision Zero Coordinator, Legal Department

PROMOTE A CULTURE OF SAFETY

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Launch Vision Zero public safety campaign.	Education is the key piece that ties engineering, enforcement and behavior together. It will raise awareness about Vision Zero and help everyone see themselves as part of the solution and know that behavioral choices matter. Based on the data in this plan, a public safety campaign that will identify key messaging strategies and partnerships is being developed. The goal is to launch the campaign in year one of the Action Plan.	Campaign launched.	Lead Agency
Hold one Vision Zero demonstration project—ideally to coincide with another crowd-drawing community event.	<p>To educate all roadway users and evaluate impacts, many communities have done demonstration projects to transform their streets, intersections, and neighborhoods into slower, safer places for people. Traffic and crash data were assessed before and after the project to evaluate effectiveness and to potentially justify a permanent treatment.</p> <p>» City of Orlando, FL, four-week demonstration project. Five-lane undivided configuration Annual Average Daily Traffic (AADT) weekday about 16,343) was transformed to include separated bike lanes on both sides of the street and a new mid-block crossing with a refuge island for pedestrians to provide a safe crossing. Results: number of vehicles traveling above the speed limit decreased by 53%, bicycle and pedestrian activity increased significantly, and 89% of pedestrians crossed in the new mid-block crossing.</p> <p>» Center City Philadelphia, nine-month project to account for seasons. The project will reconfigure the roadway from four traffic lanes to three, include pedestrian safety improvements, parking-protected bike lanes and new turn lanes. Education and traffic safety enforcement will focus on reckless/careless driving, distracted driving, driving under the influence, failure to yield to pedestrians, parking that obstructs sight lines, and red light running for people bicycling and driving.</p> <p>» Example Demonstration Project: Denali Street between 36th Avenue and Tudor Road. This project is in design and it would be an opportunity to engineer, educate, enforce, and evaluate while still in the design phase. The adjacent Midtown Cuddy Family Park and Loussac Library could also be leveraged to host concurrent events.</p>	One pilot project.	PM&E, Traffic Engineering, Vision Zero Coordinator
Create a Vision Zero concerns map.	<p>A concerns map encourages the public to contribute information about crashes, near misses, and locations with perceived safety issues. The concerns map can be used to supplement the MOA's collision data to identify sites for evaluation and treatment.</p> <p>Examples:</p> <p>New York City, NY. https://www1.nyc.gov/assets/visionzero/maps-data/vz-input-map.shtml</p> <p>Washington D.C. http://visionzero.ddot.dc.gov/VisionZero/</p>	Map available online. Data is collected and evaluated.	Vision Zero Coordinator, GIS

IMPROVE DATA COLLECTION, ANALYSIS AND ACCESSIBILITY

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Develop and implement a plan for more consistent and efficient data gathering, analysis, and reporting.	<p>Data is necessary to inform decisions, prioritize projects, evaluate pilot treatments, and set resource allocation priorities. While Anchorage is committed to being an open data city and already posts a significant amount of data on their website, all agencies would benefit from streamlining data management and analysis to the extent practicable. Ideally, the MOA and DOT&PF would use a single system. The goal is to provide the best data possible, centralized, standardized, and easy to use.</p> <p>» Philadelphia Crash Analysis Standards and Recommendations (Delaware Valley Regional Planning Commission January 2018) outlines strategies to evolve Philadelphia's crash data management and analysis processes and is based on Vision Zero peer city reviews.</p>	Plan implemented.	Lead Agency with MOA Traffic, DOT&PF, APD, AK Trauma Registry
Work with APD to improve data collection on speed, impairment and distraction (behavior) for all crashes.	<p>Improved data on the role of speed, impairment, and distraction in severe and fatal crashes is needed. Two specific areas are undercounted nationally: factors that are difficult to observe and measure such as driver behavior, and factors involving communications entertainment technologies and advanced driver assistance systems. When crash factors are not represented, regulations, laws and policies are difficult to justify, and the reasons behind them aren't data driven. (National Safety Council—<i>Undercounted is Underinvested—How Incomplete Crash Reports Impact Efforts to Save Lives</i>).</p>	Improved data on speed, impairment and distracted driving.	Lead Agency with APD
Continue to monitor and report number of people killed and severely injured on Anchorage roadways by all modes quarterly using the MOA Open Data Portal.	<p>The Vision Zero best practice is to report data to the public in user-friendly format to help educate and track progress. The availability of the existing data should be promoted and improvements to system interface, types of data reported, and accessibility to the general public should be explored. For example, under the Open Data, a Vision Zero category could be established that would house a variety of Vision Zero data.</p>	Quarterly reports. Fewer killed or seriously injured than prior reporting periods.	Lead Agency

YEARS 2 AND 3





ENHANCE PROCESSES AND COLLABORATION

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Continue to convene regular meetings of Vision Zero Task Force to review traffic safety performance and determine strategies for improvement.	Institutionalizing change and seeing positive impacts will take more than one year. The MOA should continue to measure and report on progress to date, review new data and provide comparisons to prior years, and introduce new initiatives and strategies that focus on saving lives and reducing severe injuries. The nation's two longest-running Vision Zero programs in New York City and San Francisco have reported significant progress in their efforts to prioritize safe mobility for all. It didn't happen overnight. » In 2018, more than 30 US cities have followed in New York's and San Francisco's footsteps by committing to Vision Zero. Best practices and lessons learned will continue to evolve and can be adapted to Anchorage from other Vision Zero Cities. » In 2018, the Vision Zero Network will also develop and share standards by which local communities can assess and adjust their Vision Zero efforts. » New grant opportunities continually arise and should be actively monitored.	Number of segments/intersections receiving improvements compared to prior years.	Vision Zero Coordinator, Vision Zero Task Force Members
Continue to regularly update policymakers, MOA departments, and partnering agencies.		Six updates per year	
Continue to secure a sustainable funding source for the Vision Zero program and begin to solicit grants for special Vision Zero Projects.		Sustainable funding source supported by at least one new grant.	Vision Zero Coordinator
Formalize process with DOT&PF to ensure Vision Zero best practices are incorporated in their projects as appropriate.	DOT&PF owns and maintains a significant number of roadways within the MOA. It is imperative that the MOA and DOT&PF actively work together to coordinate and fund safety improvements for new and existing projects. Advancing Vision Zero goals can likely be supported through DOT&PF's Highway Safety Improvement Program whose mission is to identify and fund highway safety projects.	Continued coordination between DOT&PF and the MOA to leverage funding.	Vision Zero Coordinator, Vision Zero Task Force, DOT&PF

BUILD SAFER STREETS FOR EVERYONE

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Reclassify MOA streets in the Official Streets and Highways Plan using an expanded context sensitive classification system to: » Have more flexibility in street design » Create priority networks for different modes of users	<p>All streets are not created equal. In order to make safer and more comfortable streets for pedestrians and bicyclists of all ages and abilities, suburban commercial principal arterials need to be designed fundamentally differently than urban mixed-use principal arterials or narrow residential local streets. The context classification of a roadway, together with its transportation characteristics, will provide information about who the users are along that roadway, regional and local travel demand, and challenges and opportunities for each roadway user. The context classification and transportation characteristics of a roadway will determine key design criteria. The classification system should address the diversity of street types and the differences in user needs in each context. The classification system should work towards a connected network of routes rather than few disconnected signature projects.</p> <p>TRB's National Cooperative Highway Research Program (NCHRP) <i>Research Report 855: An Expanded Functional Classification System for Highways and Streets</i> provides additional contexts beyond urban and rural, facilitates accommodation of modes other than personal vehicles and adds overlays for transit and freight.</p> <p>FHWA suggests designing a street with pedestrians in mind. Sidewalks, raised medians, turning access controls, better bus stop placement, better lighting, traffic calming measures, and treatments for travelers with disabilities all improve pedestrian, bicyclist, and motorist safety [FHWA-RD-03-042].</p> <p>» The City of Seattle recently adopted a comprehensive complete streets ordinance, shortly after including a complete streets provision in a transportation bond measure. The ordinance directs the City to integrate complete streets practices into all Seattle Department of Transportation (SDOT) plans, manuals, rules, regulations, and programs as appropriate. It also specifies "all sources of transportation funding be drawn upon to implement complete streets." Rather than creating a new funding pot, complete streets policies can leverage existing, mainstream transportation dollars, minimizing the cost of new bicycle, pedestrian, and transit facilities. The Seattle ordinance specifically includes maintenance and operations so improvements for biking and walking can be made during these types of projects.</p> <p>» Complete streets policies have resulted in systematic retraining of engineers (South Carolina), comprehensive new decision-making procedures (Charlotte, NC), increased funding for multimodal projects (Oregon), and added leverage for including multimodal facilities in specific projects (Sacramento, Colorado Springs).</p> <p>» The Florida Department of Transportation (FDOT) adopted a context classification system in 2017. The context classification of a roadway, together with its transportation characteristics, provides information about who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user. The National Complete Streets Coalition nominated the Florida Design Manual as one of the best complete streets initiatives.</p> <p>» The City of Saint Paul, MN was identified by the US Department of Transportation (USDOT) as an innovative leader in the implementation of complete streets. A key guiding principal is that each street design process must consider the needs and characteristics of all travel modes (driving, riding transit, walking, bicycling, moving freight) and users of all abilities and strive to identify win-win solutions for improving access and mobility of people and goods.</p>	Revised documents	Vision Zero Coordinator, AMATS, Planning, Traffic Engineering, PM&E

BUILD SAFER STREETS FOR EVERYONE (cont'd)

		Measurable Performance Metric	
Action Item	Example Best Practices	Metric	Lead
Deliver three rapid-delivery projects that each address an issue identified by the data.	Rapid-delivery projects are low-cost, "quick-hit" changes to a street, such as pavement markings, colored pavement treatments, and changes to signage or signal timing, that promptly improve street safety. Quick implementation of these projects demonstrates commitment and progress towards Vision Zero.	Three completed.	Vision Zero Coordinator, Traffic
Improve street design to support safer speeds on three streets.	Speed is a fundamental predictor of crash survival, no matter how you choose to travel. Lower speed limits are more effective when they are supported by street design that influences people to drive slower. Reducing vehicle operating speed works for several key reasons: » It gives people who drive, walk, and bike more time to see each other and react. » Reducing the speed decreases cars' stopping distance (going from 30 to 25 mph decreases stopping distance by 45 feet, or 23%). » In many cases, the change will help people avoid crashes altogether. If a crash does occur, the lower speed will reduce its severity, so people have less serious injuries. An education campaign should be part of this effort to alert users of all modes about the reason for the changes and how they can modify behaviors. » The City of Fremont, CA (population 230,000 with a relatively small budget) is using its pavement maintenance program to restripe streets with narrower lanes (10 feet), add buffered bike lanes, and paint high-visibility crosswalks. Subsequent traffic speed surveys have shown a reduction in the operating speed of the street and has allowed a lower posted speed limit from 45 to 40 mph and from 40 to 35 mph on 11 major street corridors. » Seattle redesigned four miles of principal arterial roads in two years. The projects have enhanced conditions for people walking, bicycling, driving, and riding transit. There have been zero serious collisions since implementation. For example, between 2005 and 2014, there were nearly 3,600 total collisions along the eight-mile segment of Rainier Ave S (average daily traffic ranges between 19,700 and 26,600 vehicles). Seattle re-engineered one mile of the roadway from four to three lanes, reduced the speed limit from 30 mph to 25 mph, added transit and pedestrian improvements, and adjusted signal timing. Collisions were reduced by 15%, speeds were reduced between 10% and 16%, transit travel times improved by one minute during the PM peak hour, and there have been zero serious injuries or fatalities.	Three streets completed.	Vision Zero Coordinator, Traffic, PM&E
Example Best Practice engineering solutions are presented in Appendix A.			
Improve three pedestrian and/or bicycle street crossings/corridors identified as having the highest risk (high bicyclist/pedestrian demand, high posted speed, multiple lanes, poor sight lines, and lacking a median).	An important step toward Vision Zero is designing streets that maximize safety for the most vulnerable road users—pedestrians and bicyclists. The focus area for these initial projects should be downtown and midtown along high injury networks and parallel networks. Solutions should be tailored to the specific issues to be solved, context, adjacent land uses, and other factors. An education campaign should be part of this effort to alert users of all modes to the reason for the changes.	Three crossings improved.	Vision Zero Coordinator, Traffic, PM&E
Example best practice engineering solutions are presented in Appendix A.			

BUILD SAFER STREETS FOR EVERYONE (cont'd)

		Measurable Performance Metric	
Action Item	Example Best Practices	Metric	Lead
Develop a program to review and identify improvements for transit stop locations and access to stops (sidewalks/paths/crossings) to ensure safety and accessibility. Priority will be given to stops along the high injury network.	Most people who ride transit for daily transportation reach their stops by walking. It is often necessary for pedestrians to cross roadways when traveling to and from transit stops. Proper placement of bus stops is a key component of user safety. Bus stops should be located at intervals that are convenient for passengers to minimize crossing of the street at unmarked mid-block locations (especially on multi-lane roadways). Bus stops should also be easily reachable by means of accessible travel routes. Considerations for safety improvements may include adding crosswalks, adding and/or repairing sidewalks, improving lighting, adding bus shelters, and relocating transit stops.	Improve three stop locations. Increased percentage of transit stops with safe crossings.	Public Transit, Traffic, PM&E, Vision Zero Coordinator
Integrate Vision Zero into the planning and development review process to ensure all projects take into consideration the transportation system's most vulnerable users.	Decisions around such issues as land use zoning, development planning, and parking policies significantly impact the likelihood and severity of crashes and must be better coordinated with a focus on safety. Many of the high injury network roads are characterized by longer blocks and auto-oriented land uses that facilitate higher speeds. They offer fewer crossing opportunities and lack adequate walkways and bikeways. Shorter blocks, connected street networks, and mixed land uses can reduce crash risk by making it viable and attractive for people to drive less. » In Montgomery County, MD, the Planning Department is integrating Vision Zero into master planning efforts. » In San Francisco, CA, the Planning Department adopted a resolution to include Vision Zero goals in near-term and long-term planning documents, including the General Plan, and to require development projects to incorporate pedestrian and bicycle safety measures.	Vision Zero integrated into Planning Department master planning and reviews.	MOA Planning, Traffic, Vision Zero coordinator
Hold one demonstration project in downtown Anchorage that coincides with another event.	Continue to educate all roadway users and evaluate impacts from demonstration projects. Use evaluation and crash trend data to identify comparable locations citywide that could benefit from modifications.	One demonstration project completed.	PM&E, Traffic, Vision Zero Coordinator
Review lighting levels in the Design Criteria Manual.	More light isn't always the right answer, rather the right light is key to provide greater contrast and to help make people be more visible, especially people walking at nighttime. Sensors can provide important data to determine the type of lighting needed at a given intersection and help maintain lighting infrastructure. Similar to traffic lights, street lighting can then be controlled remotely. Cameras can be added to lighting infrastructure to gather data on how many people are crossing at each intersection. » Portland Bureau of Transportation (PBOT) is testing new lighting guidelines and crosswalk spacing standards. The lighting guidelines increase recommended minimum light levels and require analysis of sidewalks and bicycle facilities when evaluating lighting needs. The crosswalk spacing standards specify maximum desired distances between marked pedestrian crossings. » San Francisco's innovative WalkFirst project ranked roadway lighting improvements as highly effective at improving pedestrian safety at a medium cost and over a long time frame.	Lighting level standards updated.	PM&E, Traffic

CREATE SAFER SPEEDS

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Examine design speeds, existing speed limits and speed data to find opportunities to more effectively lower speeds and reduce speeding-related traffic deaths through the application of education, engineering, and/or enforcement measures.	<p>The National Transportation Safety Board (NTSB) concludes that using the 85th percentile speed to set speed limits may have unintended consequences; more specifically, that raising the speed limit to match the 85th percentile speed may lead to even higher operating speeds, raising the 85th percentile and encouraging more dangerous travel speeds. NTSB recommends revising traditional speed setting standards to balance with the safe systems approach, incorporating other critical factors, such as crash history and the safety of people walking and bicycling.</p> <p>The FHWA's recent change to the controlling criteria means that there are fewer controlling criteria where design exceptions will be required for approval by FHWA. These changes will give local jurisdictions who own low-speed National Highway System (NHS) roadways additional flexibility to design projects that improve communities while meeting transportation needs. www.fhwa.dot.gov/programadmin/standards.cfm.</p> <p>As part of Vision Zero programs, cities have lowered speed limits as one way to make streets safer for pedestrians and bicyclists.</p> <ul style="list-style-type: none">» The City of Portland, OR no longer uses the 85th percentile but relies on land use and context» The City of New York City won approval from New York's State Legislature to reduce the citywide default speed limit from 30 mph to 25 mph, created a citywide camera enforcement program, and decreased fatalities by 24% (safest six-month period ever).» FDOT plans to lower design speeds in some urban areas to 25-30 mph to improve roadway safety.» The City of Boston's default speed limit is 25 mph.» The State of New Hampshire enacted legislation allowing a municipality to petition the New Hampshire Department of Transportation (NHDOT) to set a reduced seasonal speed limit to increase safety conditions on roads that are seasonally congested with pedestrian and bicycle traffic. If NHDOT agrees, the speed limit can be no lower than 20 mph and the change cannot extend longer than four months total a year; the municipality is responsible for signage costs.	Revised speed setting standards	Vision Zero Coordinator, Traffic, PM&E, APD
Implement pilot speed safety cameras on two high injury networks. Expand program to additional high injury networks following the pilot study.	<p>Automated enforcement has been proven to curb dangerous driving behaviors when used at appropriate locations.</p> <ul style="list-style-type: none">» Fairfax, VA saw a 44% reduction in red light running violations during the first year of operation. Two other sites in the city that did not have cameras experienced decreases in violations of 34%. Control sites in nearby counties experienced little change.» Oxnard, CA had 41% fewer red-light violations within a few months of installation.» Montgomery County, MD installed speed cameras in 2007 and has reduced by 59% the likelihood of a driver exceeding the speed limit by more than 10 mph and by 19% the likelihood of crashes resulting in fatalities or incapacitating injuries, according to a study by the Insurance Institute for Highway Safety.	Reduction in speed and red light running related crashes along high injury network	APD
Implement pilot red light running safety cameras at two high injury intersections. Expand program to additional high injury networks following the pilot study.	<p>It is recommended that the initial pilot program for red light running operate from May 1 to September 30.</p>		

PROMOTE A CULTURE OF SAFETY

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Continue Vision Zero public safety campaign and evaluate its success.	Effective street safety education creates a common set of expectations and changes behavior. It is important to continue to deploy, test and evaluate the effectiveness of the campaign.		Vision Zero Coordinator
Work with a broad range of agencies and organizations to promote traffic safety, such as schools, social service providers, and programs that work closely with immigrant or homeless populations.	<p>Families Acting For Community Traffic Safety Teen RSA Initiative: This youth-led effort engages students, school administrators, local law enforcement and others in the community to study the intersections in front of their schools and evaluate five key areas important to road safety. The goals of the program are to:</p> <ul style="list-style-type: none">» Use peer-to-peer education to engage students in addressing a geographic area they use daily, whether walking or driving» Connect students with local members of their community to address road safety» Help teens become smarter drivers, pedestrians, and bicyclists, through education and awareness <p>The Anchorage School District has a Safe Routes to Schools program and holds Bike Rodeos and Walk to School Days to educate school-age children.</p> <p>Major cities like Los Angeles, San Francisco, and Washington DC award grants to grassroots organizations who work to improve transportation safety and can help advance Vision Zero. Grant money comes from revenues generated by automated traffic enforcement, state DOT programs, public health department through the Center for Disease Control and city funds.</p>	Four activities per year	Vision Zero Coordinator
Require Vision Zero Safety training for all MOA employees and contractors who drive vehicles as part of their job.	<p>Those who drive vehicles professionally have a special responsibility to prioritize safety on the roadway. Improved driver training and vehicle safety features can help prevent crashes or reduce the severity of injuries if they occur.</p> <ul style="list-style-type: none">» The City of New York City implemented the Vision Zero Fleet Safety Forum which brings together people representing private fleets, equipment suppliers, federal, state, and city agencies, non-profits, and universities to address the common goals of vehicle safety. Through the fleet forum, New York City has conducted outreach within and outside of government to exchange best practices, promote vehicle safety technology, and educate fleet managers about Vision Zero.» The City of San Francisco has added Large Vehicle Urban Driving Safety training to their City employee driver training and has included telematic tracking to report driver behavior.» Many communities are installing side guards (skirt- or rail-style barriers that are installed on medium- and heavy-duty trucks to prevent side underride crashes on large vehicles). If a pedestrian or cyclist collides with the side of a moving truck, the side guard should prevent them from being run over by rear wheels.	<p>Provide training for new employees during on-boarding.</p> <p>Plus one safety meeting a year dedicated to Vision Zero</p>	Vision Zero Coordinator, Safety Department

PROMOTE A CULTURE OF SAFETY (cont'd)

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Continue to strategically target vehicular red light running and speeding. Add distracted driving and driving under the influence through increased APD presence/enforcement and a focused education campaign along the high injury network.	<p>With enforcement there is a priority that every interaction be treated as an opportunity to educate. Cities across the country routinely hold distracted driving and red light running sting operations to call attention to the law and attract media outlets.</p> <ul style="list-style-type: none">» Tennessee Highway Patrol stationed officers on public transit buses to identify distracted drivers in adjacent vehicles which were then ticketed by other officers.» Atlanta-area police officers dressed as construction workers to spot distracted drivers.	Reduction in impaired and distraction related crashes along high injury networks.	Vision Zero Coordinator, APD
Provide training when adding pedestrian or bicycle safety infrastructure to teach all users how to navigate the network.	<p>The City of Columbus, OH created an outreach program and dedicated web page to accompany their rollout of protected bike lanes. Pilot projects typically include hands-on training during the project launch.</p>	One training per year with newly implemented project	Vision Zero Coordinator
Revise Title 9 to include a Vulnerable User Law.	<p>Provide legal protection to vulnerable users. A "vulnerable user of a public way" typically means a pedestrian, a highway worker, a person riding an animal or a person operating a skateboard, roller skates, in-line skates, scooter or bicycle on a public way, crosswalk or shoulder of the roadway. Nine states have vulnerable user laws: Connecticut, Delaware, Florida, Hawaii, Maine, Oregon, Utah, Vermont, and Washington.</p> <p>Oregon sample language:</p> <p>The police officer issuing the citation for an offense under this section shall note on the citation if the cited offense appears to have contributed to the serious physical injury or death of a vulnerable user of a public way.</p> <p>(1) A person commits the offense of careless driving if the person drives any vehicle upon a highway or other premises described in this section in a manner that endangers or would be likely to endanger any person or property.</p> <p>(2) The offense described in this section, careless driving, applies on any premises open to the public and is a Class B traffic violation unless commission of the offense contributes to an accident. If commission of the offense contributes to an accident, the offense is a Class A traffic violation.</p> <p>(3) In addition to any other penalty imposed for an offense committed under this section, if the court determines that the commission of the offense described in this section contributed to the serious physical injury or death of a vulnerable user of a public way, the court shall:</p> <ul style="list-style-type: none">(a) Impose a sentence that requires the person to:<ul style="list-style-type: none">(A) Complete a traffic safety course; and(B) Perform between 100 and 200 hours of community service, notwithstanding ORS 137.129 (Length of community service sentence). The community service must include activities related to driver improvement and providing public education on traffic safety;(b) Order, but suspend on the condition that the person complete the requirements of paragraph (a) of this subsection:<ul style="list-style-type: none">(A) A fine of up to \$12,500, notwithstanding ORS 153.018 (Maximum fines); and(B) A suspension of driving privileges for one year as provided in ORS 809.280 (Department procedures following court order of suspension or revocation); and(c) Set a hearing date up to one year from the date of sentencing.	Vulnerable User Law enacted	Legal Department



IMPROVE DATA COLLECTION, ANALYSIS AND ACCESSIBILITY

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Produce an annual Vision Zero report.	» New York City NY: The Vision Zero Crash & Interventions Map is an interactive tool that shows fatal and severe injuries. This data is queried and aggregated on a monthly basis. » Los Angeles CA: The City of Los Angeles has launched LA GeoHub to display key Vision Zero data sets and share and build comprehensive transportation and health databases in support of Vision Zero goals.	Annual report	Vision Zero Coordinator
Publish citywide collision reporting in an accessible, user-friendly format, highlighting equity metrics when appropriate.		Published and updated annually	Vision Zero Coordinator
Develop speed/red light running specific reports.	Timely reporting is needed to understand ongoing extent of the problem and the effectiveness of solutions. Demonstrating outcomes can ensure that the most effective treatments are implemented, build public support, and help secure funding.	One report per year.	Vision Zero Coordinator, APD
Monitor before and after studies of completed projects and Vision Zero actions and report findings to the public in the annual report.		Documented in annual report	Vision Zero Coordinator, Traffic Data

BEYOND YEAR 3





Action Item	Example Best Practices	Measurable Performance Metric	Lead
Increase bicycle and pedestrian data collection in priority locations, developing a regular reporting system available to the public.	<p>Counting programs can help prioritize and leverage funding for improved biking and walking facilities, provide risk exposure data for crash analysis, and evaluate the effectiveness and use of non-motorized facilities.</p> <ul style="list-style-type: none">» Inductive loops (installed in pavement) and pneumatic tubes (sit on top of pavement) are commonly used to count bicyclists.» Active or passive infrared sensors are common for counting pedestrians. They also may collect combined counts of bicyclists and pedestrians.» Video technology is available for counts in crosswalks and other complex locations.» Manual observation can collect both counts as well as driver yielding behavior, pedestrian delay, crossing locations, and other relevant factors.» MOA Traffic Department and the City of Fairbanks have installed permanent and mobile automated counters to supplement limited annual manual counts.	Conduct targeted pedestrian/ bicycle counts and crossing observations at three priority locations per year.	Vision Zero Coordinator, Traffic
Establish Collision Review Team	Establish a multidisciplinary review team that will review each fatal crash as soon as possible after the event to identify potential actions the MOA or DOT&PF can take at that or other similar locations to address safety issues. The team should look at all possible causal factors.	Conduct on-site crash reviews of each fatal crash.	APD, Traffic, M&O, Pedestrian/ Bicycle Coordinator, PM&E
Reference Public Right-of-Way Accessibility Guidelines (proposed PROWAG) as Best Practice in the Design Criteria Manual	<p>Although the PROWAG has not become law, it is recommended as “best practices” by FHWA. PROWAG will not be an enforceable standard until it is formally adopted as a requirement by DOJ and DOT.</p> <p>Examples of Adoption: Indiana DOT, Oklahoma DOT</p>	PROWAG Referenced.	PM&E, Traffic

Action Item	Example Best Practices	Measurable Performance Metric	Lead
Judiciously explore aesthetic treatment of crosswalks in high-pedestrian areas	<p>Crosswalk treatments can communicate a message to drivers that they are entering a pedestrian area and need to pay attention, which calms traffic and improves safety. These treatments can also provide a sense of place and cultural identity.</p> <p><i>Manual on Uniform Traffic Control Devices (MUTCD)</i> requirements— White, retroreflective pavement marking lines must be used to officially establish a legal crosswalk. Brick pavers and colored decorative paving treatments that simulate brick or other patterns may be used between the white crosswalk lines. However, colors that degrade the contrast of the white crosswalk lines with the adjoining areas and colors that might be mistaken by road users as a traffic control application or might otherwise constitute a distraction should not be used for this purpose. So, for example, the standard colors of red and yellow used for STOP signs and warning signs should not be used, nor should the colors white and yellow as these are used for pavement marking lines. Also, retroreflective colored pavements of any color or pattern are prohibited between crosswalk lines. All other colors for use on highway pavement in the right-of-way are either disallowed or are experimental as described above...unless the colored pavement is a purely aesthetic treatment and makes no discernible attempt to communicate with a roadway user.”</p> <ul style="list-style-type: none">» In Boston, MA, the Commission for Persons with Disabilities reviews proposed designs.	Policy on crosswalk treatments developed.	Vision Zero Coordinator, Traffic Department
Require Vision Zero Safety training for drivers of taxicabs, limousines, and vehicles for hire (as defined in AMC Title 11.20)	<p>Taxi and for-hire drivers play a key role in street safety and can be engaged in Vision Zero efforts through education, enforcement, and other strategies.</p> <ul style="list-style-type: none">» The City of Portland passed regulations of for-hire transportation companies requiring mandatory safety training for drivers of taxis and transportation network companies like Uber or Lyft.» The City of New York City as created a Vision Zero video that is required viewing for taxi operators.	Safety program implemented.	Vision Zero Coordinator, Transportation Commission
Shift trips from motorized to active modes of transportation and transit to reduce crashes, lessen congestion, improve air quality, and improve health.	<p>Studies show that cities with high public transportation use have lower fatality rates. Research shows that modest increases in public transit mode share can provide disproportionately high traffic safety benefits. This suggests that typical US urban regions can reduce their traffic fatality rates 10-40% by making public transit a higher priority, in conjunction with various support strategies such as pedestrian and bicycling improvements, commute trip reduction programs, efficient parking management, and transit-oriented development policies (American Public Transportation Association. <i>Public Transit is a Key Strategy in Advancing Vision Zero, Eliminating Traffic Fatalities Policy and Research</i>. August 2018).</p> <ul style="list-style-type: none">» Since 2010, City of Seattle has reduced single-occupant vehicle trips to downtown from 35% to 25% through transit expansion, non-motorized facilities, downtown housing, and other factors.» Pittsburgh has increased bicycle commute mode share from 0.4% in 2000 to 2.6% by expanding on-street bicycle facilities.	Reduced drive-alone auto mode share.	Vision Zero Coordinator, PM&E, Traffic, Transit
Require Transportation Safety Education as part of Anchorage School District curriculum.	Nationally, novice teen drivers are twice as likely as adult drivers to be in a fatal crash. Oregon statistics based on 4 years worth of data shows that teens age 15 to 20 without driver education are responsible for 91 percent of teen driver crashes. Driver's education programs are designed to teach teen drivers the rules of the road and to help them become safe drivers so they can acquire the necessary driving skills to prepare for and pass the road driving test and, ultimately, obtain a driver's license.		
Educate Mat-Su Borough commuters about Vision Zero.	Over 14,000 people commute from the Mat-Su Valley every day. They need to be part of the solution.	Education campaign implemented.	Vision Zero Coordinator, Mat-Su Borough
Revise driver's education and testing to address all travel modes.	Education and testing should focus on all modes to address equity and how people use the streets.	DMV Driver's Manual revised.	Vision Zero Coordinator, State DMV



SOLUTIONS TOOLBOX

THIS LIST OF COUNTERMEASURES INCLUDES NATIONALLY RECOMMENDED DESIGN ELEMENTS THAT PROVIDE **SAFER CROSSINGS, SAFER SPEEDS, AND SAFER STREETS FOR ALL USERS.**

These treatments were selected based on the crash patterns and trends from data, observations from field reviews, and professional resources such as the American Association of State Highway and Transportation Officials (AASHTO), the Manual on Uniform Traffic Control Devices (MUTCD), and the National Association of City Transportation Officials (NACTO) regarding systemic safety.

Some treatments are inexpensive retrofits, pavement markings, and signage that can be changed and quickly implemented. Some require greater study, coordination, and funding.

In addition to these site-specific treatments, network improvements to complete gaps, provide alternative routes, or establish new, lower-conflict facilities can shift non-motorized user demand from high injury networks and enhance user experience and safety.





BICYCLE FACILITIES

MULTI-USE PATH



Anchorage, AK

Multi-use paths are paved, bi-directional trails away from roadways that can serve both pedestrians and bicyclists. Multi-use paths can be used to create longer-distance links within and between communities and provide regional connections. They play an integral role in recreation, commuting, and accessibility due to their appeal to users of all ages and skill levels.

Benefits

- Provides facility for both pedestrians and bicyclists in less space than separate facilities.
- Separation from motor vehicles can attract users of all levels.

Constraints

- May be unsafe in areas with frequent crossings or driveways.
- When parallel to roadways, requires substantial space for buffer.
- Potential for conflicts between bicyclists and pedestrians due to shared facility.
- Isolated paths may introduce personal security concerns.

Typical Applications

- Medium- to long-distance links within and between communities that also serve as recreational facilities.
- Parallel to roads in rural areas where sidewalks and on-street facilities are not present.

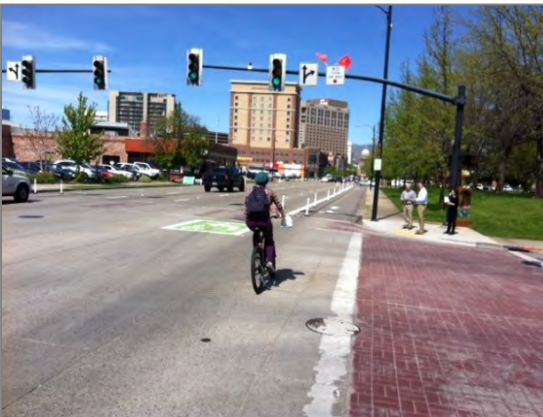
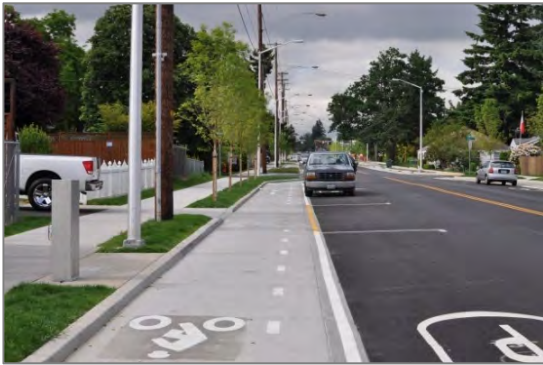
Design Considerations

- Best suited in areas where roadway crossings can be minimized (such as parallel to travel barriers such as highways, railroad tracks, rivers, shorelines, natural areas, etc.).
- Require high-visibility treatments for crossings.
- A minimum width of 10 feet is recommended for low-pedestrian/bicycle-traffic contexts; 12 to 20 feet should be considered in areas with moderate to high levels of bicycle and pedestrian traffic.
- Pavement markings can be used to indicate distinct space for pedestrian and bicycle travel.



BICYCLE FACILITIES

ONE-WAY SEPARATED BIKE LANE (CYCLE TRACK)



A one-way separated bike lane (SBL), also known as a cycle track or protected bike lane, is a bicycle facility within the street right-of-way separated from motor vehicle traffic by a buffer and a physical barrier, such as planters, flexible posts, parked cars, or a mountable curb. On two-way streets, a one-way SBL would be found on each side of the street, like a standard bike lane.

Benefits

- Provides physical separation from motor vehicle traffic, which can attract users of all levels.
- Buffer can provide opportunities for landscaping.
- Reduced risk of “dooring” when parked cars are present.

Constraints

- Requires additional right-of-way over standard bike lane.
- Construction may be more expensive than standard bike lane.

Typical Applications

- Roadway segments with sufficient right-of-way or where a “road diet” (vehicle lane reduction) can be implemented.
- Key segments of the bicycle network where more protection is desirable, such as areas with higher traffic volumes or speeds, or routes to common destinations, like schools.
- Roadways with infrequent driveways and side street accesses.

Design Considerations

- Intersections must be designed to ensure visibility of bicyclists using the facility. Treatments include separate signal phases for bicyclists and high visibility pavement markings.
- Buffer type can vary depending on context, presence of parking, and available right-of-way.
- Green pavement markings or striping can add visibility and awareness in “conflict areas” or intersections where bicycle and vehicle travel paths cross.



BICYCLE FACILITIES

TWO-WAY SEPARATED BIKE LANE (CYCLE TRACK)



A two-way separated bike lane (SBL), also known as a two-way cycle track or protected bike lane, is a facility within the street right-of-way separated from motor vehicle traffic by a buffer and a physical barrier, such as planters, flexible posts, parked cars, or a mountable curb. Two-way SBLs serve bi-directional bicycle travel within the facility on one side of the street.

Benefits

- Requires less right-of-way than a one-way SBL, due to the need for only one buffer.
- Provides physical separation from motor vehicle traffic, which can attract users of all levels.
- Reduced risk of “dooring” when parked cars are present.

Constraints

- May be less intuitive for drivers and bicyclists due to apparent “wrong-way” travel on one side of street.
- May be unsafe in areas with frequent crossings or driveways.
- Construction may be more expensive than standard bike lane.

Typical Applications

- On-street connections between off-street multi-use paths.
- Roadways with infrequent driveways and side street accesses.
- Key segments of the bicycle network where more protection is desirable, such as areas with higher traffic volumes or speeds or routes to common destinations, like schools.
- On one-way streets where two-way bicycle travel is desirable.

Design Considerations

- Intersections must be designed to ensure visibility of bicyclists using the facility. Treatments include separate signal phases for bicyclists and high visibility pavement markings.
- Buffer type can vary depending on context, presence of parking, and available right-of-way.
- Green pavement markings or striping can add visibility and awareness in “conflict areas” or intersections where bicycle and vehicle travel paths cross.





BICYCLE FACILITIES

BUFFERED BIKE LANE



Buffered bicycle lanes are on-street lanes that include an additional striped buffer of typically 2-3 feet between the bicycle lane and the vehicle travel lane and/or between the bicycle lane and the vehicle parking lane.

Benefits

- A parking-edge buffer on streets with on-street parking can reduce the likelihood of “dooring.”
- Increased separation from motor vehicles (over standard bicycle lanes) can increase bicyclist comfort.

Constraints

- Does not provide physical protection and therefore may not attract bicyclists of all levels.
- The additional width provided by the buffer may invite motorists to illegally park in the lane if not adequately signed and enforced.



Typical Applications

- Long-distance links within and between communities.
- Streets with sufficient pavement width to provide a buffer.
- Widely applicable in both urban and rural settings.
- Segments of the bicycle network with moderate vehicle speeds or volumes.

Design Considerations

- Typical buffer width is 2-3 feet, in addition to standard bicycle lane width of 5-6 feet.
- Green pavement markings or striping can add visibility and awareness in “conflict areas” or intersections where bicycle and vehicle travel paths cross.
- Buffer space can have diagonal stripes or rumble strips to deter vehicles from traveling or parking in the space.



BICYCLE FACILITIES

STANDARD BIKE LANE

A standard bike lane is an on-street facility that provides space designated for bicyclists, separated from vehicles by pavement markings.



Anchorage, AK

Benefits

- Provides a designated facility for bicyclists using the minimum pavement width.
- Provides increased visibility for bicyclists.
- Relatively inexpensive treatment when pavement width is available.

Constraints

- Can position bicyclists in the “door zone” if located adjacent to parked vehicles without a buffer.
- Motorists may illegally park in the lane if not adequately signed and enforced.
- Does not provide physical protection or horizontal buffer from vehicles and therefore does not attract bicyclists of all levels.

Typical Applications

- Arterials, collectors, and other non-local streets with speeds higher than 25 mph or over 3,000 average daily motorized traffic volumes.
- Streets without sufficient right-of-way or pavement width for buffered bike lanes or separated bike lanes (SBLs).

Design Considerations

- Typical bike lane width is 6 feet, with 5 feet in constrained locations. A minimum 4-foot width can be used on constrained segments where on-street parking is not present.
- Green pavement markings or striping can add visibility and awareness in “conflict areas” or intersections where bicycle and vehicle travel paths cross.



Anchorage, AK

ADVISORY BIKE LANE



Advisory bike lanes, also known as “suggestion lanes,” are bicycle lanes that motor vehicles can use to pass oncoming motor vehicles after yielding to bicyclists. Advisory bicycle lanes are used in combination with a single center lane (without a centerline) for bi-directional motor vehicle travel on relatively low-volume streets.

Benefits

- Provides striped bicycle facility on roadways with very limited right-of-way or pavement width.
- Encourages slower motor vehicle speeds and yielding to bicyclists.
- Very inexpensive treatment consisting of only signing and striping.

Constraints

- Motorists may not initially understand advisory lanes due to limited applications in the US to date.
- Does not provide physical protection from vehicles and may not attract bicyclists of all levels.

Typical Applications

- Streets with less than 6,000 average daily motorized traffic that do not have sufficient width for unshared bicycle facilities.
- Can be applied in urban or rural contexts.

Design Considerations

- Advisory bike lanes can be striped as 5-7 foot lanes with a single center motorized vehicle lane of 10 to 18 feet.
- Explanatory signage may be helpful in US contexts to communicate to motorists that they must yield to bicyclists before passing oncoming vehicles.



BICYCLE FACILITIES

PAVED SHOULDER



A paved road shoulder can serve as a bicycle facility that provides space separated from motor vehicle traffic in rural areas.

Benefits

- Provides a space separated from motorists.
- Requires less right-of-way than a separated multi-use path.

Constraints

- Does not provide physical protection from vehicles and may not attract bicyclists of all levels.
- Shoulders serving other uses, such as broken-down vehicles, may force bicyclists into travel lanes.

Typical Applications

- Typically applied on rural roadways.
- Also used as an interim treatment in urbanizing areas.

Design Considerations

- A 6-foot width is preferred to accommodate bicycle travel, with a 4-foot minimum in constrained areas. Greater widths can be used in higher-speed locations.
- Rumble strips or profiled striping can be used to enhance safety and minimize motorists encroaching on the shoulder.



BICYCLE FACILITIES

BICYCLE BOULEVARD



Anchorage, AK



Bicycle boulevards are low-volume, low-speed streets where bicycles and motorized vehicles share road space, but where bicycle movements are prioritized and optimized through use of motorized vehicle restrictions, traffic calming elements, and intersection crossing treatments.

Benefits

- Typically does not require additional right-of-way.
- Can create a comfortable space for bicyclists of all levels.
- Enhances connectivity of the network for bicyclists.

Constraints

- Bicycle boulevards may reduce through routes for motorized vehicles
- Some treatments, such as traffic circles or chicanes, may be expensive.

Typical Applications

- Local routes parallel to larger, higher-traffic roadways, such as arterials or collectors.
- Low-traffic neighborhood routes that can enhance the bicycle network connectivity.

Design Considerations

- A variety of traffic calming elements can be employed, including speed humps, traffic circles, chicanes, median barriers, and traffic diverters in order to keep traffic volumes low and minimize through-traffic.
- Consider providing “bicycle-only” through movements at intersections, where motorists are required to turn off the bicycle boulevard.
- Include shared lane markings and wayfinding signage for bicyclists.
- Recommended for streets with posted speeds of 25 mph or lower and volumes less than 3,000 average daily motorized traffic.



BICYCLE FACILITIES

SHARED LANE ROADWAYS



Anchorage, AK

Shared lane roadways include roadways without separate bicycle facilities on which bicycle travel is not prohibited. Most roadways, with the exception of some limited access freeways, are “shared lane roadways” if they do not have a different type of bicycle facility. Shared lane roadways that are part of a designated bicycle network may include shared lane markings (“sharrows”) or signage to indicate the legal presence of bicyclists in the travel lane.

Benefits

- Allows for bicycle travel when other treatments are not feasible.
- Low- to no-cost.

Constraints

- Does not provide any separation from vehicles.
- Without additional traffic-calming treatments, it is likely to attract only strong and fearless bicyclists.

Typical Applications

- Rural roadways without shoulders often use “share the road” signage to indicate to road users that bicyclists may be present.
- Sharrows are typically used in urban or suburban locations on bicycle network links where other facilities are not present.

Design Considerations

- Sharrows should be placed at least 4 feet from the edge of the curb or on-street parking.



PEDESTRIAN FACILITIES

MULTI-USE PATH



Multi-use paths are paved, bi-directional, trails away from roadways that can serve both pedestrians and bicyclists. Multi-use paths can be used to create longer-distance links within and between communities, provide regional connections, and play an integral role in recreation, commuting and accessibility due to their appeal to users of all ages and skill levels.

Benefits

- Provides opportunity for a scenic recreational pedestrian facility.
- Hard surface allows for universal accessibility.

Constraints

- Pedestrian and bicycle conflicts may occur in shared space.
- When parallel to roadways, requires substantial space for buffer.
- Isolated paths may introduce personal security concerns.

Typical Applications

- Medium- to long-distance links within and between communities that also serve as recreational facilities.
- Rural areas where sidewalks and on-street facilities are not present.

Design Considerations

- Best suited in areas where roadway crossings can be minimized (such as parallel to travel barriers such as highways, railroad tracks, natural areas, rivers, shorelines, etc.).
- Necessitate high-visibility treatments for crossings.
- A minimum width of 10 feet is recommended for low-pedestrian/bicycle-traffic contexts; 12 to 20 feet should be considered in areas with moderate to high levels of bicycle and pedestrian traffic.
- Pavement markings can be used to indicate distinct space for pedestrian and bicycle travel



PEDESTRIAN FACILITIES

SIDEWALK



A sidewalk is a dedicated pedestrian facility adjacent to the roadway and separated from traffic by a curb.

Benefits

- Provides pedestrians with a dedicated physically separated space.
- Provides means of mobility for people using wheelchairs, people with strollers, or others who may not be able to travel on an unpaved surface.

Constraints

- Adding a concrete curb and sidewalk to streets adds a substantial expense to the overall construction cost.

Typical Applications

- Typically provided on urban (non-rural) and residential streets, with the exception of limited access freeways.
- Typically added to streets in urbanizing areas as development occurs.

Design Considerations

- Typically 6 to 8 feet wide. Sidewalks should be constructed at least 5 feet wide, with a minimum of 4 feet of clear width, excluding a shy distance of 1.5 feet from the curb and any adjacent obstructions.
- A landscaped buffer is preferable in residential areas and in locations with higher traffic speeds and volumes.
- Wider sidewalks of 12 to 20 feet can be beneficial in commercial or “town center” areas in order to accommodate higher pedestrian volumes, street furniture, pedestrian scale lighting, business signage, bike parking, transit stops, and other amenities.



PEDESTRIAN FACILITIES



Anchorage, AK

PEDESTRIAN PATH (SIDEPATH)



Anchorage, AK

A pedestrian path is a hard-surface path adjacent to the roadway in lieu of a sidewalk in areas where other bicycle facilities exist. Similar to a multi-use path, pedestrian paths are narrower in width and generally do not invite bicycle travel.

Benefits

- Provides a hard surface for pedestrians buffered from the roadway.
- Requires less right-of-way than a multi-use path.
- Lower cost than construction of a full sidewalk with curb and gutter.

Constraints

- May also attract bicyclists, creating the potential for conflicts between pedestrians and bicyclists.

Typical Applications

- In constrained rural areas where sidewalks are not present and multi-use paths cannot be accommodated.
- As an interim treatment in urbanizing areas to make connections between sidewalk facilities.



PEDESTRIAN FACILITIES



Anchorage, AK

Design Considerations

- Typically 5- to 8-foot wide asphalt surface.
 - Pedestrian paths are typically separated from the roadway by a gravel or vegetated buffer instead of a curb and gutter.
 - Should follow ADA standards to allow for universal access.
 - Though not intended for bicyclists, pedestrian paths may attract bicyclists if a separate bicycle facility is not provided.
-



PEDESTRIAN FACILITIES

SHOULDER PEDESTRIAN FACILITY



A paved shoulder facility provides access for pedestrians on a hard surface in rural areas where sidewalks are not present.

Benefits

- Provides a hard surface space separated from motorists.
- Requires less right-of-way than a separated multi-use path.
- More cost-effective than installing sidewalks.

Constraints

- Does not provide physical protection of a curb and may not be comfortable for all users.
- Shoulders serving other uses, such as broken-down vehicles, may force pedestrians into travel lanes.

Typical Applications

- Typically applied on rural roadways.
- Also used as an interim treatment in urbanizing areas.



Anchorage, AK

Design Considerations

- A 6-foot width is preferred to accommodate pedestrian travel, with a 4-foot minimum of paved surface in constrained areas. Greater widths can be used in higher-speed locations.
- Rumble strips or profiled striping can be used to enhance safety and minimize motorists encroaching on the shoulder.

GRADE SEPARATED CROSSING



Anchorage, AK

A grade-separated crossing is a bridge (overcrossing) or a tunnel (undercrossing) that carries non-motorized traffic over or under a motorized corridor or other barrier to travel.

Benefits

- Provides physical separation from motor vehicle traffic, attracting users of all levels.
- Minimizes crash risk and can provide a safe crossing of any type of facility, including railroads and limited access highways.

Constraints

- Grade-separated crossings can be very expensive.
- Depending on topography, may require significant additional space to make grade changes.
- Long under-crossings have the potential to present safety and security issues.

Typical Applications

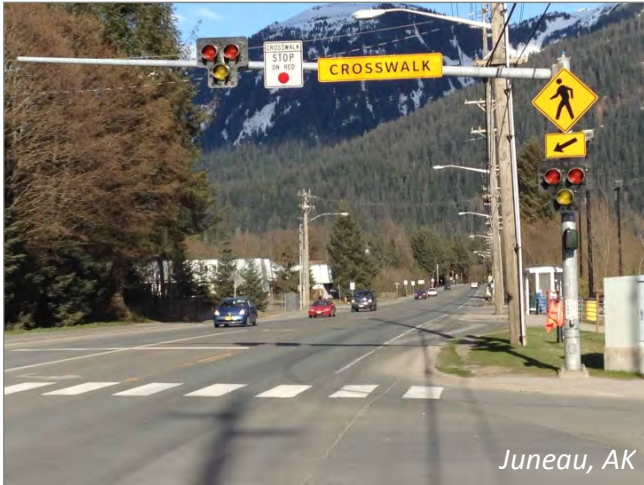
- Crossings of limited access highways, multi-lane roadways, or railroads.
- Multi-use path crossings often have grade separated crossings in order to provide comfortable and safe crossings for users of all levels.

Design Considerations

- If a substantial slope or out-of-direction travel is required, some bicyclists or pedestrians may avoid using the crossing, so minimize slope and out-of-direction travel if possible.
- In selecting a grade separated crossing, consider the surrounding topography, natural features, and floodplain.
- Consider whether the crossing needs to accommodate equestrians.
- Ensure adequate sight distance for bicyclists entering the facility to see oncoming bicyclists or pedestrians. If not possible, consider requiring bicyclists to dismount.

GENERAL CROSSING TREATMENTS

PEDESTRIAN HYBRID BEACON



Juneau, AK

A pedestrian hybrid beacon (sometimes called a HAWK signal) is a pedestrian activated signal that is unlit when not in use. It begins with a yellow light alerting drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians cross the street. Finally, the beacon shifts to flashing red lights to signal that motorists may proceed after pedestrians have completed their crossing.

Benefits

- Has nearly 100 percent rate of motorist yielding behavior at crossing locations.
- Improves pedestrian safety and reduces pedestrian-involved crashes.

Constraints

- Must be activated by pedestrians.
- More costly than other crossing treatments.

Typical Applications

- Midblock crossings with high pedestrian or bicycle demand and/or high traffic volumes.
- At locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the pedestrian hybrid beacon should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).



GENERAL CROSSING TREATMENTS

RAPID RECTANGULAR FLASHING BEACON (RRFB)



These crossing treatments include signs that have a pedestrian-activated “strobe-light” flashing pattern to attract motorists’ attention and provide awareness of pedestrians and/or bicyclists that are intending to cross the roadway.

Benefits

- Provides a visible warning to motorists at eye level.
- Increases motorists yielding behavior at crossing locations over round yellow flashing beacons (80 to 100 percent compliance).
- Allows motorists to proceed after yielding to pedestrians and bicyclists.

Constraints

- Flashing beacons must be activated by pedestrians.
- Motorists may not understand the flashing lights of the RRFB, so compliance may be lower than with a traffic signal.

Typical Applications

- Midblock crossings with medium to high pedestrian or bicycle demand and/or medium to high traffic volumes.
- Locations where multi-use paths intersect with roadways.

Design Considerations

- The push button to activate the RRFB should be easily accessible by pedestrians, wheelchair users, and bicyclists (if applicable).
- Consider adding a push button in the median island for crossings of multi-lane facilities.



CROSSING ISLAND (PEDESTRAIN REFUGE)



Anchorage, AK

A crossing island in the median provides a protected area in the middle of a crosswalk for pedestrians to stop while crossing the street. Also called pedestrian refuge islands or median refuges, they can be used at intersections or mid-block crossings.

Benefits

- Reduces pedestrian exposure at marked and unmarked crosswalks.
- Requires shorter gaps in traffic to cross the street.
- Allows pedestrians to cross in two phases.

Constraints

- Streets with constrained right-of-way may not have sufficient width to allow for a crossing island.

Typical Applications

- Preferred treatment for crossings of multi-lane streets.
- Often used in areas with high levels of vulnerable pedestrian users, such as near schools or senior centers/housing.
- Often applied in areas with high traffic volumes or with a pedestrian crash history.

Design Considerations

- Must have at least 6 feet of clear width to accommodate people using wheelchairs.
- At crossing locations where bicyclists are anticipated, a width of 10 feet or greater is desirable to accommodate bicycles with trailers or groups of bicyclists.
- Can be applied in conjunction with other traffic control treatments.



BULB-OUT/CURB EXTENSIONS



An extension of the curb or the sidewalk into the street (in the form of a bulb), usually at an intersection, that narrows the vehicle path, inhibits fast turns, and shortens the crossing distance for pedestrians.

Benefits

- Shortens crossing distances for pedestrians.
- Reduces motorist turning speeds.
- Increases visibility between motorists and pedestrians.
- Enables permanent parking.
- Enables tree and landscape planting and water runoff treatment.

Constraints

- Can only be used on streets with unrestricted on-street parking.
- Physical barrier can be exposed to traffic.
- Greater cost and time to install than standard crosswalks.
- Can present turning radius problems to large vehicles.

Typical Applications

- Mid-block or intersection pedestrian crossings on streets with unrestricted on-street parking.
- Streets with on-street parking where pedestrian volumes ≥ 20 pedestrians per hour, ADT $\geq 1,500$ vehicles per day, and average right-turn speeds ≥ 15 mph.

Design Considerations

- Include a narrow passage for bicyclists to prevent conflict with vehicles.
- Provide accessible curb ramps and detectible warnings.
- Include landscaping on the curb extension to differentiate path for pedestrian travel, especially for pedestrians with vision impairments.

GENERAL CROSSING TREATMENTS

RAISED PEDESTRIAN CROSSING



Anchorage, AK



Anchorage, AK

Raised pedestrian crossings bring the level of the roadway even with the sidewalk, providing a level pedestrian path and requiring vehicles to slow. Raised crossings can be used at midblock crosswalks or intersections.

Benefits

- Provides a better view for pedestrians and motorists
- Slows down motorists.

Constraints

- Can be difficult to navigate for large trucks, snow plows, and low ground clearance vehicles.
- Relatively expensive.

Typical Applications

- Raised crosswalks are typically provided at midblock crossings on two-lane roads where pedestrian volumes ≥ 50 pedestrians per hour and speed control is needed.
- Raised crosswalks may be provided at intersections where low-volume streets intersect with high-volume streets or where a roadway changes character (such as from commercial to residential).
- Raised crosswalks should not be used on transit routes or where there are steep grades or curves.

Design Considerations

- Raised crosswalks should be even with the sidewalk in height and at least as wide as the crossing or intersection.
- Provide detectable warnings for pedestrians where they cross from the sidewalk in to the crossing area.
- Consider drainage needs and provide appropriate treatments.
- Use colored asphalt as opposed to brick or decorative surface materials to make the crossing smoother for those with mobility impairments.

GENERAL CROSSING TREATMENTS

HIGH VISIBILITY CROSSWALK



High visibility crosswalks consist of reflective roadway markings and accompanying signage at intersections and priority pedestrian crossing locations.

Benefits

- Communicates potential for pedestrian crossings to motorists.
- Designates a preferred crossing location for pedestrians.
- Motorists are required to stop for pedestrians entering crosswalks.
- Low cost.

Constraints

- Can be more effective with other types of traffic control (signals, stop signs).
- At uncontrolled locations (midblock), motorist compliance is not as high as with other treatments.

Typical Applications

- High visibility crosswalks are typically applied at intersections of arterials, collectors, and/or other facilities with moderate to high vehicle volumes and speeds.
- Can be applied at mid-block locations, especially in conjunction with other treatments.

Design Considerations

- Crosswalk striping can vary, and may include continental striping (top photo), ladder striping, zebra striping (bottom photo), etc.
- Can be constructed with paint or thermoplastic material.
- Minimum width is 6 feet, but wider crossings are preferred in areas with high number of pedestrians.



Anchorage, AK

GENERAL CROSSING TREATMENTS

PEDESTRIAN LIGHTING



Pedestrian lighting may increase nighttime street visibility for pedestrians where existing illumination does not readily address crossing locations.

Benefits

- Increases visibility of pedestrians waiting to cross and in the crossing.

Constraints

- Potential to restrict and/or clutter sidewalk environment near the crosswalk.
- On-going maintenance and operating costs.

Typical Applications

- Crossings or areas with high levels of nighttime pedestrian activity (e.g., greater than 20 pedestrians per hour).
- Locations with a high frequency of nighttime pedestrian crashes.
- Could also be considered for crossings with lower pedestrian volume activity if crossing conflict is severe or unexpected (e.g., pedestrian crossing location across a higher speed roadway).
- Can be used in conjunction with other crossing treatments.

Design Considerations

- Illumination could be used to contribute to the identity of a district or neighborhood and serve as a unifying element in the streetscape.
- Lighting should be scaled to the street and land use contexts to avoid light pollution/trespass and ensure a comfortable illumination quality for users.

▪

GENERAL CROSSING TREATMENTS

LEADING PEDESTRIAN INTERVAL (LPI)



A leading pedestrian interval gives pedestrians a 2-5 second head start before the concurrent vehicle phase turns green to allow pedestrians to enter and occupy the crosswalk before turning vehicles get there.

Benefits

- Pedestrians are more visible in the crosswalk before vehicles start moving.
- Helps reduce conflicts with pedestrians and turning vehicles.

Constraints

- Reduces green time for vehicle movements.
- May add to delays at intersections operating near capacity.

Typical Applications

- Used in areas where right-turning vehicle movements often interfere with pedestrian crossing movements.
- Intersections with a documented history of turning movement-related vehicle-pedestrian crashes.

Design Considerations

- Only possible when pedestrian signal faces are present.
- The leading pedestrian interval should give a minimum head start of 3-7 seconds depending on crossing distance.
- May be combined with a curb extension to improve visibility at high-conflict intersections.

Additional Guidance

- Only possible when pedestrian signal faces are present.
- ITE *Traffic Engineering Handbook*
- NACTO *Urban Street Design Guide*



BICYCLE INTERSECTION TREATMENTS

BIKE SIGNAL



Bicycle-only signals can be used at intersections to provide a separate signal phase that is dedicated to bicyclists.

Benefits

- Provides bicycles with a dedicated signal phase without potential motor vehicle conflicts.
- Provides increased protection for bicyclists.

Constraints

- May increase intersection delay for motorists and bicyclists with the addition of a signal phase.

Typical Applications

- Roadway intersections with multi-use trails.
- At intersections with separated bike lanes on the roadways, or at transitions to and from two-way separated bike lanes.
- At intersections where large numbers of turning vehicles have the potential to conflict with through bicycle movements.

Design Considerations

- Ensure that signal heads are clearly visible to cyclists.
- Install painted indicators on bicycle detectors to show bicyclists where to wait.
- Consider prohibiting right-turn-on-red for motorists if right turns conflict with bicycle movements.



BICYCLE INTERSECTION TREATMENTS

BIKE BOXES



Bicycle boxes are designated spaces at signalized intersections, placed between a set-back stop bar and the pedestrian crosswalk, that allow bicyclists to queue in front of motor vehicles at red lights.

Benefits

- Increases the visibility of queued bicyclists.
- Allows bicyclists to start up and enter the intersection in front of motor vehicles when the signal turns green and/or position for a left-turn.
- Provides queuing capacity for bicycles at signals beyond a typical bike lane.

Constraints

- Driver compliance rates vary.
- Bike boxes may prevent drivers from making right-turn-on-red movements.

Typical Applications

- Signalized intersections, particularly those with high bicycle volumes.
- Signalized intersections where a designated bicycle route turns left.

Design Considerations

- Minimum depth of the bike box should be 10 feet, and it should extend across the bike lane, any buffer space, and at least one adjacent vehicle travel lane.
- Can be extended across multiple vehicle lanes on multilane streets to allow bicyclists to position for left turns.



BICYCLE INTERSECTION TREATMENTS

TWO-STAGE LEFT TURN BOXES



Two-stage left-turn boxes allow bicyclists to safely and comfortably make left turns at multi-lane intersections from a right-side bicycle lane or cycle track. Bicyclists arriving on a green light travel into the intersection and pull out into the two-stage turn queue box away from through-moving bicycles and in front of cross street traffic, where they can wait to proceed through on the next green signal.

Benefits

- Provides a low-stress option for left turns, so that bicyclists do not need to merge into traffic.
- Provides a clear and visible location for queuing bicyclists waiting to cross.

Constraints

- May be difficult to accommodate within a constrained intersection geometry.

Typical Applications

- At signalized intersections with multi-lane roadways.
- At locations where a low-stress left-turn movement for bicyclists is desirable.

Design Considerations

- Should be located out of the way of through bicyclists, usually between the bike lane and the crosswalk. If there is on-street parking, space may be available between the bike lane and vehicle travel lane.
- Consider using passive bicycle detection in the two-stage left turn box to call the green signal phase for bicyclists.





BICYCLE INTERSECTION TREATMENTS

PAVEMENT MARKINGS THROUGH INTERSECTIONS



Pavement markings can be extended through the intersection for both cycle tracks and bicycle lanes. Green paint can be used in “conflict zones” where vehicles and bicycles may cross paths in intersections, at driveways, or at right turn pockets.

Benefits

- Green paint can alert drivers of a conflict zone.
- Paint through an intersection can help bicyclists know where to cross and alert drivers to look for bicyclists.

Constraints

- Paint may wear more quickly in intersections and require additional maintenance due to vehicles crossing it more frequently.

Typical Applications

- Intersections and conflict zones, especially in high-traffic or high-speed areas.



Design Considerations

- Use white dashed lines at a minimum to extend a treatment through an intersection or across a conflict zone. Dashed green pavement can enhance awareness and visibility.
- Other non-standard treatments, such as solid green paint or bicycle “chevron” markings have been used in locations throughout the U.S.



BICYCLE / PEDESTRIAN AMENITIES

STREET FURNITURE AND LIGHTING



Anchorage, AK

Street furniture includes pedestrian seating, information/wayfinding structures, and trash cans. Street furniture and lighting can be used to enhance the pedestrian experience and encourage pedestrian activity on a street.

Benefits

- Encourages walking and sense of comfort and security for pedestrians.
- Relatively inexpensive and easy installation.
- Encourages foot traffic and can make local attractions/businesses inviting.

Constraints

- Requires space in potentially busy areas, such as sidewalks.

Typical Applications

- Typically provided at areas of high bicycle and pedestrian traffic such as bus stations, shopping centers, schools, and multi-use trails.
- Street furniture and pedestrian-scale lighting are usually provided on corridors with commercial activity and anticipated high pedestrian use.

Design Considerations

- Street furniture should not be placed to block the entrance of a building or inhibit pedestrian flow.
- The type and size of street furniture should be based on the available space and anticipated demand.
- Street furniture should be accessible to all users.



Anchorage, AK

BICYCLE / PEDESTRIAN AMENITIES

TRANSIT STOP SHELTERS



Transit stop shelters help protect passengers waiting to load the bus from the elements and provides a great level of comfort. They also increase the visibility of transit stops and attractiveness for riders.

Benefits

- Provides protection from the elements and a place to sit for people waiting for transit.
- Provides a prominent visual cue about where the transit stop is located.

Constraints

- Costs more than a simple signed bus stop.
- Requires additional sidewalk width beyond a standard 6-foot width.

Typical Applications

- Typically provided at bus stops with higher levels of activity or those that serve major transfer points, senior communities, schools, or major trip generators.
- May be paired with other bus stop amenities, like benches and bicycle parking.
- Shelters can be fully enclosed or just an overhead canopy, although semi-enclosed shelters are most common.

Design Considerations

- The style of the transit stop shelter can depend on the preferences of the local jurisdiction.
- At stops with a high number of daily boardings (i.e. over 100), a larger shelter or multiple shelters should be considered.
- Shelters should be cleaned and maintained regularly.
- Shelters should have transparent sides for greater visibility, and panels should be resistant to fading or clouding.

RUMBLE STRIPS



Pavement surface treatments intended to cause drivers to experience vehicular vibrations signaling them to slow down. Rumble strips can be raised pavement markers across the roadway or grooves along the shoulder or centerline. Rumble strips are best used in conjunction with other traffic calming treatments.

Benefits

- Low cost.
- Speed reduction and increase in driver awareness.

Constraints

- Vibration noise created may be inappropriate in residential areas.
- Perceived more as a warning to slow down, than a physical measure that forces slower speeds.
- Impacts the comfort and control of bicyclists.
- Potential impacts on pavement deterioration based on pavement quality and placement.

Typical Applications

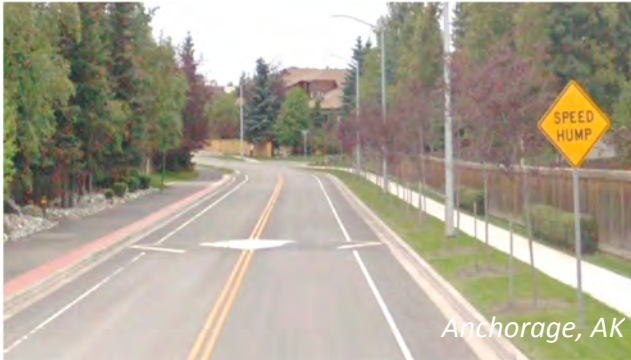
- Roadways with high speeds or where driver inattention is an issue.
- Rumble strips can be used on shoulders to alert drivers they are entering a part of the roadway not intended for use.
- Roadway rumble strips placed across the roadway are used to alert drivers of a changing roadway condition or the need for speed reduction.

Design Considerations

- All road users need to be considered and accommodated. Bicycles need particular attention, especially if they are expected to use the roadway or shoulders.
- There are a variety of types of rumble strips, so the site application should be considered to determine the most appropriate design.

ROADWAY TREATMENTS

SPEED BUMPS, SPEED HUMPS, SPEED TABLES



There are a number of raised treatments that can be used in the roadway to slow vehicular traffic, including speed bumps, humps and tables.

Speed humps utilize a larger vertical radius than speed bumps that results in wider widths and a gentler crossing by vehicles.

Speed tables are wide mountable obstructions installed on the pavement surface across travel lanes and intended to cause vehicles to slow. Speed tables are wider flat-top speed humps and are gentler on vehicles. They can be used on higher order roads than bumps or humps because they allow for a smoother ride and higher speeds.

Benefits

- Relatively inexpensive.
- Effectively slows vehicle speeds, with speed bumps and humps reducing speeds more than speed tables.
- Easily navigated by bicyclists.

Constraints

- May be considered noisy by nearby residents.
- Forces emergency vehicles to slow down.
- Inappropriate on streets with bus traffic due to rider comfort and reduced travel speeds.

Typical Applications

- Speed bumps or humps can be used on lower order roadways, whilst speed tables are appropriate on higher order roadways.
- Roadways where a reduction in speeds and traffic calming is desired.
- Speed bumps, humps, or tables work well with curb extensions.

Design Considerations

- Drainage needs should be considered and accommodated.
- Treatments should be used midblock, not at intersections.
- Treatments are not appropriate on roadways with grades over 8%.
- Advance signing and pavement markings on the treatment can be provided.
- Typically preferred for treatment not to cover a bike lane.

REDUCED CURB RADII



Street corner is reconstructed with a smaller radius to reduce vehicle turning speeds by forcing sharper turns.

Benefits

- Forces sharper turn by right-turning motorists and thus slower speeds.
- Improves safety of pedestrians by reducing crossing width and slowing motorists.

Constraints

- Requires additional space that may not be available.
- Makes turning movements more challenging for large vehicles and may not accommodate all trucks.

Typical Applications

- Typically used at intersections with high vehicle speeds and high pedestrian volumes where space is available.

Design Considerations

- The street type, angle of intersection, land uses, etc. should be considered when designing the curbs.
- Maintenance vehicles, emergency vehicles, school buses, and other anticipated large vehicles should be considered in the design.
- The effective turning radius (considering presence of parking, bike lanes, medians, etc.) should be used to evaluate the ability of vehicles to make a turn, not the curb return radius.
- In locations where reducing the curb radius is challenging based on design vehicles, consider using a compound radius, at-grade paving treatments, or advance stop lines.

ROADWAY TREATMENTS

INTERSECTION PAVEMENT MARKING DELINEATION



This treatment accentuates traffic lines, pavement markings, and channelization used to direct traffic on the roadway.

Benefits

- Helps guide motorists to choose and stay in the proper lane.
- Can be used to visually narrow travel lanes in support of reduced speeds.
- Raises awareness for bicyclists and motorists to potential conflict areas.

Constraints

- Adds to striping costs.
- Maintenance costs.



Typical Applications

- At intersections with multiple adjacent turning lanes, more than four legs, and/or are skewed.
- Along roadways with bike lanes or cycle tracks.

Design Considerations

- Old pavement markings should be properly removed so that drivers are not confused if old markings remain visible.
- Attention to skid resistance of the markings.
- Dotted lines shall bind the bicycle crossing space. See MUTCD Section 3B.08 for dotted line extensions through intersections.

RED LIGHT RUNNING CAMERAS FOR AUTO ENFORCEMENT



This treatment is a type of traffic enforcement that captures an image of the vehicle which has entered an intersection in spite of the traffic signal indicating red, i.e. during the red phase.

Benefits

- Decreases red light running violations.
- Decreases number of intersection crashes.

Constraints

- Maintenance and operating costs.
- Privacy concerns.

Typical Applications

- At signalized intersections with a high rate of red light running.
- At signalized intersections with a high rate of intersection crashes or severe injuries related to intersection crashes.

Design Considerations

- Reevaluate sight distance to the signal at intersections.
- Reevaluate stopping sight distance.



SPEED FEEDBACK SIGNS



This treatment is designed to provide a message to drivers exceeding a certain speed threshold. They are known as dynamic warning signs, radar speed/message signs, and dynamic speed display signs.

Benefits

- Alerts drivers of their current driving speed versus the posted speed limit.

Constraints

- Not self-enforcing.
- Duration of effectiveness is limited.

Typical Applications

- Often installed in high speed zones to alert drivers to slow down when they are exceeding the speed limit.
- A speed feedback sign may be used in areas with high pedestrian-related crash history.

Design Considerations

- Speed studies and appropriate modifications to the speed limits should first be considered before deploying a speed feedback sign.
- May be considered when the observed 85th percentile speeds at a study exceed the posted limit by 5 mph or more.

ROADWAY TREATMENTS

AUTOMATED SPEED ENFORCEMENT



This treatment is a type of automated enforcement that records vehicle speed using fixed or mobile cameras or radar and takes a photograph of the vehicle when it exceeds a speed limit threshold.

Benefits

- Increases enforcement to change driver behavior about driving above the speed limit.
- Impartial and consistent in enforcing the speed limit.
- Reduces fatal and non-fatal crash injuries.

Constraints

- Privacy concerns.
- Installation and operating costs.
- Alaska does not have laws specific to speed cameras.

Typical Applications

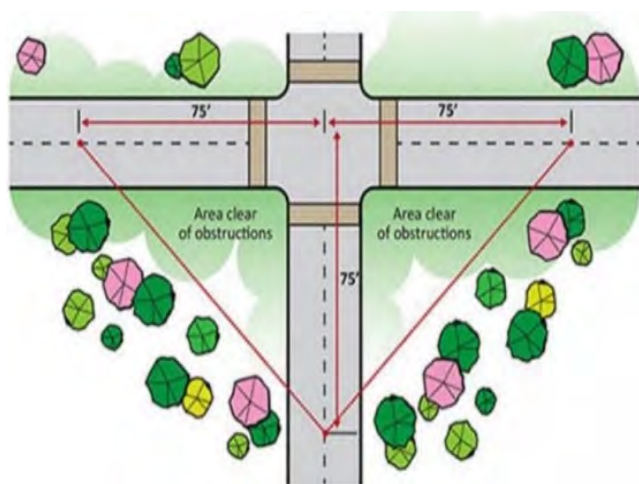
- Locations where dangerous speeding and speeding-related crashes are especially frequent.

Design Considerations

- Consider both a mobile and fixed automated speed enforcement system.
- Do public outreach to educate and get public acceptance prior to designing and installing cameras.
- Awareness of the NHTSA Guidelines.



SIGHT DISTANCE IMPROVEMENTS



Sight distance improvements can often be achieved by clearing sight triangles to restore sight distance obstructed by vegetation, roadside appurtenances, buildings, bus stations, and other objects which are in the right-of-way.

Benefits

- Provides time for drivers to take appropriate actions during hazardous situations.
- Rear end crashes can be reduced with improved forward visibility.
- Good forward visibility at pedestrian crossings will give drivers more time to react.

Constraints

- High cost can be associated with this treatment if realignment of the roadway or acquisition of more right-of-way is required to remove obstructions.

Typical Applications

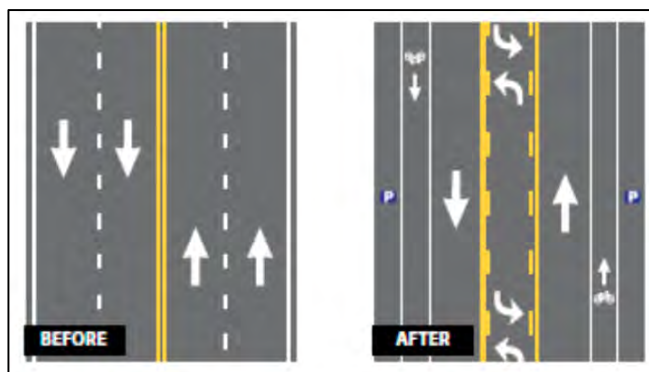
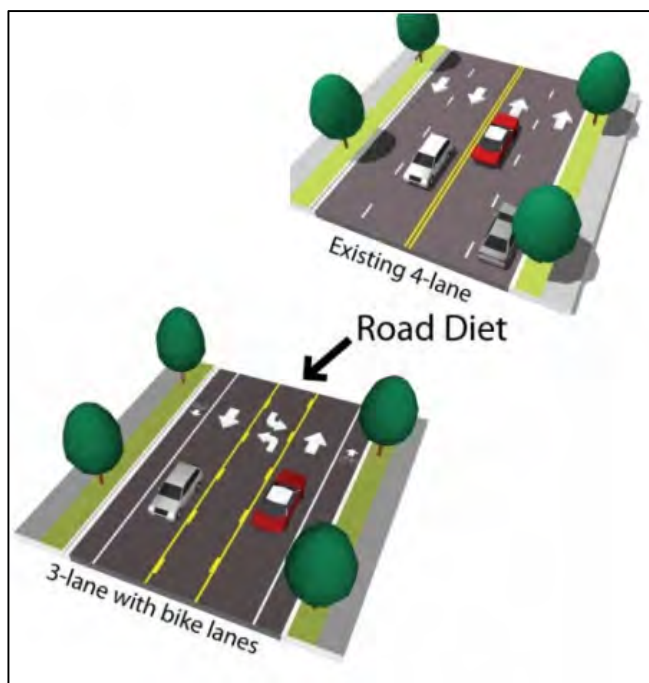
- At intersections with restricted sight distance and patterns of crashes related to poor sight distances.

Design Considerations

- Ensure traffic signs and signal heads are not obstructed by vegetations and street furniture.
- At intersections, sight lines and visibility splays are often required at larger angles to the user's normal viewpoint.

ROADWAY TREATMENTS

ROAD DIETS



This treatment reduces the number of vehicle lanes on roadway to manage vehicle speeds and reduce risk of crashes for all road users.

Benefits

- Lowers vehicle speeds.
- Reallocates roadway space for other needs such as bike lanes and pedestrian paths.
- Helps provide vehicular access for turning into and out of commercial and business driveways.

Constraints

- May increase travel time.
- Transit vehicles/mail trucks can block traffic when stopped.
- May create issues with snow storage.
- Possible decrease in roadway capacity.

Typical Applications

- Converting a four-lane undivided roadway to a three-lane cross section, with one lane in each direction and a two-way center left turn lane.

Design Considerations

- Road function and context – rural, urban, suburban neighborhood, etc.
- Design controls – design vehicles, drivers, non-motorized users, speed.
- Screening all upcoming resurfacing projects allows agencies to incorporate a road diet at no additional costs.
- For roads with fewer than 10,000 ADT, capacity will most likely not be affected.

ROAD SEGMENT EDGE LINES



This treatment involves installing/markings edge lines to define or delineates the edge of a roadway.

Benefits

- Provides a visual reference to guide motorists along the travel lane.
- Reduces drifting onto the shoulder and roadside areas.

Constraints

- Adds to striping costs.

Typical Applications

- Applicable when traveled way exceeds 20 feet in width.
- Apply just prior to and within a curved section of a road.

Design Considerations

- Recommended for rural arterials and collectors with an ADT of 3,000 per day.
- Edge lines should be considered on roadways that do not have center lines.



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